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Presidential Address

IN

SECTION OF MEDICINE*

RT. HON. LORD DAWSON OF PENN, G.C.V.O., C.B.

Physician to the London Hospital; Member of the Senate University of London

ALTHOUGH the days of lengthy inaugural addresses—perhaps to our profit—are passing, I hope you will agree it would be fitting for me to speak briefly by way of introduction to the proceedings of this section.

First, let me say how highly I value the honour of being President of the Section of Medicine, for service in medicine is always an honour and a joy to those who love their profession. This annual meeting may be said to be notable—notable in that it records substantial advance in the knowledge of malignant disease, the fear of which rarely escapes any home at some time or another, and we enjoy the proud thought that such has come as just reward to British investigators: notable because this Association is giving expression to the realization of the widening range of its usefulness in the domains of learning, education and public good; notable for gathering in this ancient city, rich in traditions which inspire its citizens, and not least, its doctors, with wisdom and courage in meeting the problems of to-day.

This is not the occasion to discuss the brilliant researches into cancer which are occupying our interest, but a fact of general import emerges that before the cancer virus can invade an animal, there has to be created in that animal a factor or nidus which will enable the virus to get foothold, and what is remarkable, this factor or nidus is more specific, more individual, than the virus itself. The virus has a measure of interchangeability as between animal and animal, but the internal factor belongs exclusively to one domain.

This brings forth in graphic manner what is always borne in upon clinicians—viz. the individuality of disease—or rather how individual, how varied is man in his reactions to morbid processes—a fact which is worthy of remembrance even by those who are concerned with systems of government.

And the way in which this internal chemical factor conditions the growth of cancer emphasizes the fact that with the wane of the acute infections, medicine will be concerned more and more with the condition of the individual man—his resistance, his qualities which make for good and for evil.

So medicine will occupy itself increasingly with the fascinating but difficult study of trends and tendencies, with the border country between the physiological and the pathological; and this will in its turn bring medicine more in contact with how man thinks, and acts, and works, and plays—in short how he has his being—and will make those who seek man's well-being feel the need of its co-operation.

It follows that though the outlook of medicine will alter—its horizon will widen—its disciples will be inspired as always by the unceasing quest for knowledge, and on the other hand by the bringing of the wisdom of that knowledge to man's service, as the prophets, but not the vassals of statesmanship.

*It was hoped to publish this address at the same time as Sir Humphry Rolleston's on "Rheumatoid Arthritis." Owing to a regrettable delay in its receipt, this was impossible.

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Before concluding I would like to pass from thought to the man and yet the change is not abrupt when one recalls that the man who is in our minds gave brilliant expression to the thought.

I refer to Clifford Allbutt. He was not only physician and thinker, but a great leader for this Association during the troublous years of the war.

There were gathered within him many attributes forming an harmonious whole of rare beauty, wide knowledge, ripe scholarship, broad outlook, the living faith that to-morrow will be better than to-day. Moreover he portrayed in a manner exceptional, if not unique, the physical beauty which can belong to advanced age.

The greatest tribute to age is the allegiance and affection of the young and these were his in supreme measure. His was the glory of the setting sun—now living, refulgent,—and then passing in a few moments behind the horizon, leaving us an abiding influence and grateful memory.

CANCER OF THE COLON*

Its Diagnosis and Treatment

H. W. Carson, F.R.C.S.

Senior Surgeon, Prince of Wales General Hospital, London, England

WHEN your president invited me to open a discussion on the diagnosis and treatment of cancer of the colon I agreed to do so with great pleasure because this is a subject that is beset with many difficulties, and though I would like to be able to tell you that I can show you a way out of the difficulties, I will admit at once that I have no sovereign remedy and that I am hoping by joining with you in frank discussion to find out why it is that a comparatively benign cancer such as this is, and one that is peculiarly amenable to surgical treatment should be attended by so high a percentage of failure.

Let us first consider the types of cancer which affect the colon. We shall find it easier if we consider the development of the large bowel. If we draw an imaginary line from the tip of the ninth costal cartilage on the left side to the anterior superior spine on the right side we shall divide the abdomen into two halves, a right upper half which contains the cæcum, ascending colon, hepatic flexure and transverse colon, and a lower half which contains the splenic flexure, descending colon, iliac colon and pelvic colon. All that part of the large bowel to the right of the oblique line is developed from the mid-gut and is supplied by branches of the superior mesenteric artery; all that to the left of the oblique line is developed from the hind-gut and is supplied by branches of the inferior mesenteric artery. The right colon has an important share in digestion as its function is to absorb the fluid portion of the intestinal contents; the left colon has little share in digestion, its function being to retain the semi-solid intestinal contents until they are expelled by defæcation. It is natural to expect that these two halves of the colon, differently developed and having different functions would have different diseases, and as far as cancer is concerned this is so, the right bowel having a tendency to develop large comparatively rapid growing growths of a cauliflower type which ulcerate readily, while the usual cancer of the left bowel is a small slowly growing neoplasm of a scirrhous type with little tendency to ulceration but a great tendency to obstruct the lumen of the bowel.

On considering the frequency with which the various parts of the large bowel are affected with cancer we find a great preponderance of growths in the left bowel. In my own cases 73 per cent have occurred in the left colon, of which 60 per cent. have been in the iliac and

*Read at the Annual Meeting of the Canadian Medical Association, Regina, June 25, 1925.

pelvic colons. On the right side the ascending colon has been most commonly attacked, forming 15 per cent. of the whole. Now how does this affect the symptomatology? It means that in one case out of four, that is the right-sided growths, the patient may have pain, may have diarrhœa with mucus and blood in the stools, and may have a palpable tumour, for the right colon is directly under the abdominal wall, while three out of four, that is the left colon growths, will have no pain until obstruction is supervening; will have no diarrhœa and probably no blood in the stools except perhaps occult blood, and no tumour can be palpated because it is generally very small, and because the jejunum lies between the descending colon and the anterior abdominal wall. The only symptoms many of these cases have is a gradually increasing constipation. Now how is it possible to make an early diagnosis in these cases? It is not reasonable to expect every patient to call in his medical man because he is constipated. Can you not imagine the successful business man in the prime of life with increasing responsibilities, who finds that his work is tying him down more and more and limiting his opportunities for sport and fresh air, explaining his constipation to himself as being due to the confinement and lack of exercise resulting from his work, and meeting the difficulty by aperients which he finds he has to take in increasing doses? And even when he does present himself, is it the invariable rule to insist on a thorough examination? Or, if the examination is made, is a diagnosis possible even in the majority of the early cases? Here one comes at once on the main cause of failure to cure, namely the difficulty of diagnosing the early case.

What is the condition of the cases as the surgeon sees them? I have investigated eighty-one cases for the purpose of this discussion, and find that of these, thirty were obstructed when first seen (nearly 40 per cent.) and a radical operation was possible only in thirty-nine (less than 50 per cent.). The fact that I could attempt a radical cure in only twenty-two out of fifty-nine left colon growths (37 per cent.) while it was possible in seventeen out of twenty-two right colon growths (77 per cent.), shows how much more difficult it is to diagnose the left sided growth than it is the right, in its early or operable stages.

Sir Berkeley Moynihan in a discussion on cancer of the colon at the Medical Society of London, said that the discussion ought to have been opened by a general practitioner and carried on by general practitioners, so much more important did he consider early diagnosis than treatment, and I am hoping that those of you who have the opportunity of seeing these cases in their early stages will tell us your difficulties and the methods you adopt to deal with them.

Symptoms.—There are certain symptoms of which the patient may complain. There may be nothing but constipation, loss of weight, anæmia perhaps, and a disinclination for exertion. He may complain of a dragging sensation and a feeling of weight as if the bowel was not emptied after an evacuation. He is quite likely to complain of flatulence, of rumbling noises in the abdomen and of occasional attacks of colicky pain. These colicky pains are often referred to the right side and are due to distension and peristaltic contractions of the cæcum. If the growth is on the right side he may have a fixed pain at the seat of the tumour; there may be occasional attacks of diarrhœa, and blood may be noticed in the stools. It is astonishing how little constipation may affect the general health in some of these cases, in old people particularly. Vomiting is rare even in advanced obstruction.

Signs.—When you come to your examination, the first thing you should do is to look for evidence of intestinal distension. This will generally be found earliest in the cæcum, which is the most distensible part of the large intestine and when you palpate this, you may excite peristalsis so that the cæcum will harden under your hand. This is a sign of great importance and almost diagnostic of colon obstruction. Then a search is made for a tumour, and if the growth is in the right half, you will probably find it, as this part of the colon is not hidden by the small intestine. On the left side, however, it may be very difficult, except in some iliac colon growths, but not infrequently it is possible to infer the presence of a growth by finding a mass which, though not the growth itself, consists of the distended bowel full of retained fæcal material. A rectal examination completes this part of your investigation, and it is possible to feel certain pelvic colon growths through the

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anterior rectal wall, or you may feel distended coils of small intestine in Douglas's pouch.

Aids to Diagnosis.—There are three methods of examination which may be of great assistance. I should place our diagnostic methods in the following order. *First* and most important, the history and cross examination of the patient. *Second* the physical examination, and *third*, these supplementary methods. These three additional methods are, (1) the examination of the fæces for occult blood; (2) examination with the sigmoidoscope, and (3) the radiological examination. Of these, the last is far and away the most valuable.

Examination of fæces for occult blood.—The benzidine test is simple and can easily be done by the general practitioner at the bedside. It is reliable and will demonstrate the presence of blood even in minute quantity. Unfortunately it requires a special preparation in so far that the patient must not be allowed red meat for several days and there are certain possibilities of error due to the presence of blood in the stools from causes other than cancer. I refer particularly to bleeding from hemorrhoids. I think it would be better to say that a negative result to repeated examination is of more diagnostic value than a positive, that is to say that the absence of occult blood is better evidence against cancer than the presence of it is in favour of cancer.

The Sigmoidoscope has rather a limited scope. It is possible on rare occasions to see a growth low down in the pelvic colon, but the great majority of colon growths are out of sight. There is one piece of evidence that may be obtained through the sigmoidoscope if examination is made without any previous preparation. It is possible to see a trickle of blood or purulent matter coming down from above in certain cases and such evidence must be put with the rest in making a diagnosis.

Radiological examination may be done after a barium meal or after a barium enema. There is no doubt that the latter is the more valuable. With the barium meal the colon presents so many haustrations that it is impossible to define accurately the contour of the bowel, while the enema, if skilfully given, will fill the colon to the cæcum in seven or eight minutes, giving a regular contour without haustrations. Certain allowances have to be made and precautions taken. The patient must be carefully prepared to make sure that the colon is empty of fæcal matter. This is best done by giving a dose of castor oil thirty-six hours before the examination and washing out the colon with water the night before and on the morning of examination. The barium emulsion is run in from a douche can placed two feet above the patient who is lying on his back. The examination is made through the screen. In thirty per cent of normal cases a filling defect will appear at the junction of the iliac and pelvic colon, the result of spasm, but this will gradually disappear. The whole colon must be filled if possible before any detailed examination is made and very often there may be filling defects as the result of posture or air locks, the former more commonly in the transverse colon, the latter in the cæcum.

If an obstruction is present, the column of barium ends abruptly as it comes up against the growth and then gradually trickles through to fill the colon beyond the growth.

The irregular and tortuous channel, (thumb print) is very characteristic and quite different from the smooth outline of a local spasm. It is interesting to see that the emulsion passes through the ileo-cæcal valve into the ileum in probably 50 per cent. of cases, and this may even be considerable enough to render a clear view of the lower colon impossible. While it is true that a barium enema may fail to show certain obstructions, the common error is to consider as pathological, abnormalities which may prove to be only temporary and due to spasm or air locks. Palpation of the colon under the screen will clear up most of these misunderstandings.

Differential Diagnosis.—In the presence of acute obstruction, differential diagnosis may be very difficult. It is not really a simple matter to decide between large and small intestine obstruction, and even some cases of peritonitis may simulate obstruction, though this will more often resemble small than large intestine obstruction. Nor is it always easy to be certain of the exact site of the growth in the colon. These difficulties seem to those of us who object to what is called a "blind cæcostomy" to make this treatment unsound. I will return to this when I consider the question of treatment. One must always remember too that if obstruction is present, ancillary methods of diagnosis such as examination by x-rays and the examination

of the stools for occult blood are not available. But these cases generally call for an urgent laparotomy at which the diagnosis can be settled and appropriate treatment instituted.

If acute obstruction is not present differential diagnosis is not so difficult. Very rarely the colon is partially obstructed by some tumour affecting another viscus pressing on the bowel. A kidney tumour, especially a hypernephroma, has been known to cause it, especially on the left side where the colon is narrow and relatively fixed. Cancer of the stomach, and even chronic simple ulcer, has been known to constrict the transverse colon, and pelvic tumours have a part also in obstructing the lower bowel. But these conditions admit of ready differentiation. Of conditions affecting the colon there are comparatively few. On the right side the most important disease to differentiate is the *hyperplastic form of ileo-cæcal tuberculosis.* I have had quite a number of these cases and I have not found diagnosis difficult on the whole. The disease occurs in younger patients, generally between twenty and forty, its progress is slow and subject to variations, it does not tend to cause obstruction as cancer does and the characters of the tumour are different, as it conforms more to the shape of the cæcum and has a very well-defined lower border. Occasionally a *subacute appendix* may lead to a persistent mass in the cæcal region, but it does not cause obstruction, it tends to resolve or to form an abscess and it is often accompanied by an evening temperature.

Transverse colon growths may be difficult to distinguish from gastric cancer, but the symptomatology is different and x-ray examination after a barium meal or enema will always settle the diagnosis. On the left side *fæcal accumulation* and *diverticulosis* may be confused with cancer. The former is easily differentiated, but diverticulosis is sometimes so difficult that it cannot be distingushed from cancer even after an exploratory laparotomy. Diverticulosis generally occurs at an earlier age; there is a history of constipation and local pain, and frequently there are associated bladder symptoms. A very important point is that blood and pus are never found in the stools of a diverticulosis patient until late in the disease, if at all. The most reliable means of diagnosing diverticulosis is by the x-ray after a barium enema.

Treatment.—The decision as to the operative methods to be adopted in any particular case is influenced by one most important consideration, that of the presence or absence of obstruction. It is a rule to which there is no exception that no radical operation involving enterectomy and anastomosis may be attempted on an obstructed colon. The so-called one stage operation is attended by a prohibitive mortality and has been abandoned. If we accept this broad statement, and we must, we can consider the question of treatment under the two heads of operation on the unobstructed colon and operation on the obstructed colon.

Unobstructed Cases.—The general principles of operation are now fairly well standardized. They consist of free mobilization, block resection and restoration of continuity. Free mobilization is most important and many cases which seem at first to be irremovably adherent, prove, after careful and thorough freeing by division of the peritoneal reflexion on the outer side of the bowel, to be easily capable of resection. It is a simple matter to mobilize the ascending colon or iliac colon and though the splenic flexure and descending colon appear more difficult, they can always be freed if plenty of room is allowed to work in. The block resection is founded on Jamieson and Dodson's researches on the lymphatics of the colon. These are found to run with the arterial supply and as this is well defined to each section of the colon one simply removes the cancer-bearing section of the colon to the limits of its blood supply, taking the whole of its mesentery with it. Thus if the growth is anywhere in the right colon, that part of the colon supplied by the ileo colic and right colic arteries is removed. This comprises the last six inches of the ileum, the cæcum, ascending colon, hepatic flexure and the right half of the transverse colon. Nothing short of this is safe and in stripping up the colon from its bed, the right ureter, the right kidney and the knee of the duodenum should be exposed and safeguarded. The transverse colon growths are amenable to a comparatively local resection removing the parts supplied by the middle colic artery. The splenic flexure and descending colon are dealt with by a resection comprising all the colon supplied by the left colic artery, and the iliac and pelvic colon by a resection

comprising the parts supplied by the sigmoid arteries.

Restoration of continuity is done in various ways. Ileo-transverse colostomy is done after right colon resections, and elsewhere either end to end or lateral anastomosis. While my own feeling is in favour of end to end anastomosis, I do not consider that it makes much difference which method is chosen so long as the technique is right. A good deal of interest has been shown in the question of a "safety valve" as it is called, that is, should a temporary opening be made in the cæcum after the anastomosis to prevent distension proximal to the suture line? I use it in transverse colon and splenic flexure resections, but I am not sure that it really prevents accumulation of gas if the resection is as far away as the iliac colon, and my own practice has been in these cases to pass a long tube like a stomach tube, with a terminal opening at the end instead of a lateral opening, up from the anus right through the anastomosis. This drains the colon above the anastomosis and at the same time acts as a sort of splint. It will stay for several days without discomfort. Others consider it enough to dilate the anal sphincter. Others, too, consider it a wise precaution to pass a rubber sheet drain down to the anastomosis in view of the fact that leakage occurs at times owing to insecurity of the peritoneal suture due to the appendices epiploicæ. This is a precaution against which nothing can be said.

Obstructed Cases.—If obstruction is present, the position is entirely different. One must be content to save the patient's life and to put out of the question any idea of a radical cure until the patient has recovered from his toxæmia and the tone of the distended bowel has been restored. Obviously this means a two-stage, or even a many-stage operation. But before any operation is done I am convinced that it is a good plan to attempt to relieve the bowel by milder measures. It is my custom to institute for a limited period only a preliminary treatment, which consists in stopping all mouth feeding, in administering morphine and atropine to allay colonic spasm and to give enemata of oil or soap emulsion. Some of these acute obstructions are due to the temporary blocking of the narrow channel by a fæcal mass or by œdema of the mucosa, and treatment on the lines I have indicated may relieve the obstruction. This preliminary treatment must not be persisted in too long for these debilitated patients will not stand deprivation of nourishment for more than a short time and in cases where a gradually increasing partial obstruction has been present there is the risk that the cæcum, thinned and ulcerated by long continued back pressure, may give way. If this treatment is unavailing, operation must be done and the extent of the operation must be decided upon. If the site of the obstruction is known, I have no doubt that the correct operation is a cœcostomy which can be done in desperate cases under local anæsthesia. I do not think this will drain the colon adequately in pelvic colon growths, but it will relieve distension, get rid of a certain amount of retained fæcal material and allow irrigation of the colon to be done.

The further steps required can be done later through tissues unaffected by the fæcal fistula. If one opens the colon just above the growth, one can be sure of draining the proximal colon, but the tissues will be impaired for the subsequent operation and indeed this may be rendered very difficult if at the first operation one has had to mobilize the colon. I am not at all in favour of the Mickulicz operation, where the growth is withdrawn through the incision, the gut opened or the growth resected at the time and the open ends fixed in the incision.

Pharmacopœial Conference. — The International Conference on the Unification of Pharmacopœial Formulæ is to be held in Brussels in September. The government will be represented by four delegates, of whom our colleague, Sir Nestor Tirard, is one. I learn with gratification that he has been asked by the government to act as chairman of the British Delegation. The government has adopted the reserves regarding the subjects to be discussed, and the conclusions that may be reached, which were suggested by the Pharmacopœial Committee.

THE INJECTION OF LIPIODOL AS AN AID IN THE X-RAY DIAGNOSIS OF BRONCHO-PULMONARY LESIONS INCLUDING TUBERCULOSIS

Preliminary Report*

David H. Ballon, M.D.

Montreal

EVEN modern methods for the diagnosis of bronchial and pulmonary lesions leave much to be desired and any new method which may aid us in visualizing the normal and pathological appearances within the chest should be welcomed alike by the internist, the thoracic surgeon and the bronchoscopist. In recent years the bronchoscope has opened up a new and fruitful field which has been of invaluable assistance both in the diagnosis and treatment of pulmonary and bronchial affections. Jackson[1] in 1918 described the technique of lung mapping by dry bismuth insufflation, and Lynah[2] in 1920 injected through the bronchoscope a bismuth mixture in pure oil for the localization of an abscess cavity. Three years ago Dr. Birkett, at the request of Dr. Edward Archibald, employed Lynah's method in one of his cases of bronchiectasis, and succeeded in securing a perfect picture of the dilated bronchi in the x-ray plate.

During the last two or three years another epoch making aid in diagnosis has been the introduction of lipiodol in radiology. Sicard and Forestier[3] were the first in 1922 to utilize lipiodol for localization of tumours in the spinal canal. Sergent and Cottenot[4] in 1923 first studied dilatations of the bronchi and bronchiectasis in adults by intratracheal injections of lipiodol through the cricothyroid membrane, and Armand-Delille and his co-workers applied the same method in children. Armand-Delille, as it so happened rather than of set purpose, injected one tuberculous lung cavity in a child, but declared himself opposed to this procedure on account of the danger of pulmonary congestion from the iodine. This has not been our experience.

The technique of injecting lipiodol as practised by Sergent, Cottenot and Armand-Delille is as follows:—A preliminary hypodermic injection of morphine is given. The neck is prepared as for a tracheotomy. The crico-thyroid space is anæsthetized with a one per cent. solution of procain. The trachea is entered through the membrane with a fine trocar and cannula curved like a tracheotomy tube; the trocar is then withdrawn, the trachea is anæsthetized through the cannula with the one per cent. solution of procain; the lipiodol is injected and the cannula withdrawn. The patient is then turned to either side so that the oil can flow from one lung to the other, and a radiograph of the chest is immediately taken in the horizontal and vertical positions.

This technique is, of course, open to many objections; and however justifiable the method may be in children, there is no justification for its use when a bronchoscopist is available. The ideal and only safe method is by the natural route through the vocal cords into the trachea and bronchi by means of a bronchoscope. The bronchoscopic technique which I have practised during the last three years gives one not only a natural picture of the condition in the bronchi and lungs, permitting the exploration of the different lobes, the taking of cultures, aspiration, irrigation and injection of medicaments in one or both lungs, but also, should the necessity arise, permits the easy aspiration of the injected material. The procedure as practised with the injection of lipiodol is as follows:—

Patients are usually examined early in the morning on an empty stomach. A preliminary hypodermic injection of morphine or pantopon with atropine is given half an hour before the application of the local anæsthetic. The larynx

*From the Oto-Laryngological Department of the Royal Victoria Hospital, Montreal.

is thoroughly anæsthetized with the following mixture: solution of cocaine 20 per cent. one part, and adrenalin, 1/1000, two parts. The patient is then placed on the x-ray table on which he is to radiographed, a direct examination of the larynx, trachea and bronchi is made. When the vocal cords are passed the trachea and bronchi are sprayed with the above anæsthetic solution to abolish the cough reflex. Any pus or secretion is aspirated and then 10 to 30 cc. of the "warmed" lipiodol is injected in one or both lungs with a long Lukens bronchoscopic syringe. The bronchoscope is then withdrawn and roentgenograms are taken in various positions—stereoscopic, anteroposterior, lateral right and left, and with head lowered about 45° for about ten minutes, to study the effect of gravity; also in the sitting position. I have been impressed by the effect of change of posture and coughing on the location of the oil in the lung. A spasm of coughing will disseminate the oil throughout both lungs forcing it from the lower to the upper lobes, even into the apices. This observation has suggested the possibility of readily applying medicaments directly to the lung tissue and allowing them in this manner to

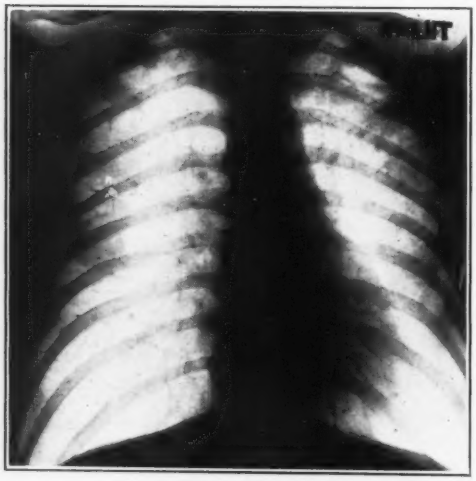

FIG. 1.—*Case I.*—Normal Volunteer. Before injection. "Gassed" during the war. Evidence of old tuberculosis exists in upper third of left lung and at right apex. The rest is practically a picture of normal lungs.

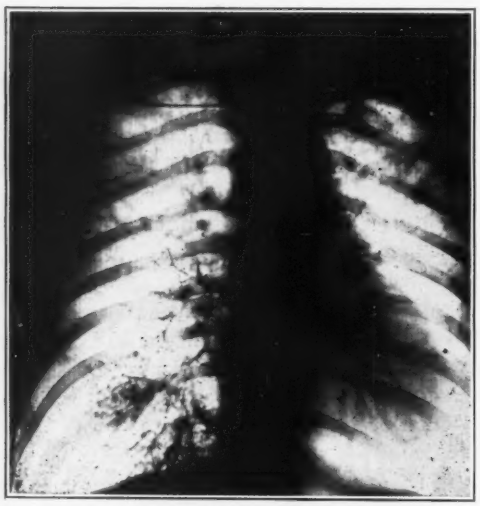

FIG. 2.—*Case I.*—Lipiodol 10 cc. injected into the lower and middle lobe of the right lung. The bronchi are seen as regular branching shadows becoming smaller in size and less obvious as they approach the periphery.

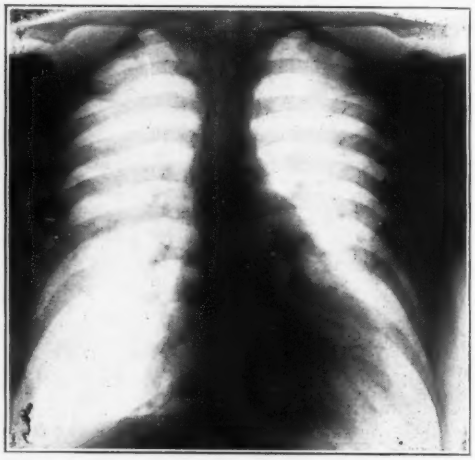

FIG. 3.—*Case II.*—Normal Volunteer. Before injection. Lungs normal. Heart dilated.

FIG. 4.—*Case II.*—Fifteen cc. lipiodol injected; normal arborization in both lungs.

become thoroughly dispersed throughout both lungs.

The patients suffer little if any pain at the time of the injection and there are scarcely any after effects. It is remarkable how tolerant the lung is to lipiodol. Some patients are very little distressed even with 30 cc. of lipiodol in their lungs. One normal volunteer, another volunteer who had been gassed during the war, and a third bronchiectatic patient went home the same day and were at work the next day. One patient with pulmonary tuberculosis had lipiodol injected two days after a phrenecotomy by Dr. Archibald. There was no rise in temperature, she felt well, and was discharged in two days. A febrile patient with pulmonary abscess had 20 cc. of lipiodol injected and felt no untoward effects.

That lipiodol has no irritating effect is evi-

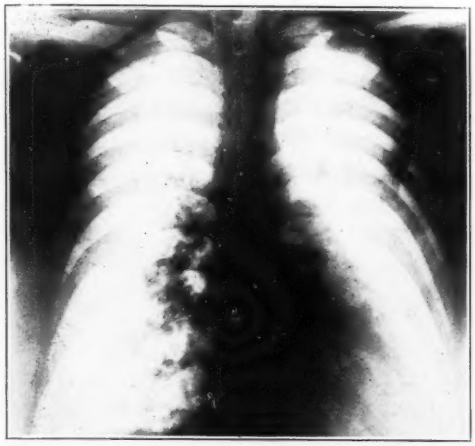

FIG. 5.—*Case II.*—Twelve days after injection. We consider these normal pictures very important as controls. In these normal lungs apart from the expected picture of the bronchial tree, it is interesting to observe the appearance afforded by the filling of the terminal broncheoles and alveoli. We may compare it to some extent with the picture of the so-called snow storm of acute exudative tuberculosis, with the difference, that in the normal the architecture of the lung parenchyma, with its regular outlines anatomically recognizable, is preserved.

FIG. 6.—*Case III.*—Lung Abscess. Twenty cc. of lipiodol injected. The trachea is outlined from the neck to its bifurcation, both bronchi are clearly defined. The injection is nearly equally distributed between the two lungs. The lipiodol has reached the alveoli at the base of the left lung but stops short in the bronchi on the right side, these bronchi are shown very full as if constricted or blocked in the region of the abscess.

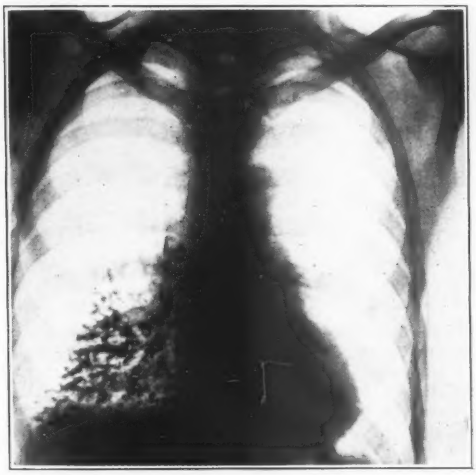

FIG. 7.—*Case IV.*—Bronchiectasis. Right lower lobe injected with 10 cc. lipiodol, shows irregular fusiform and circular shadows; no large abscess.

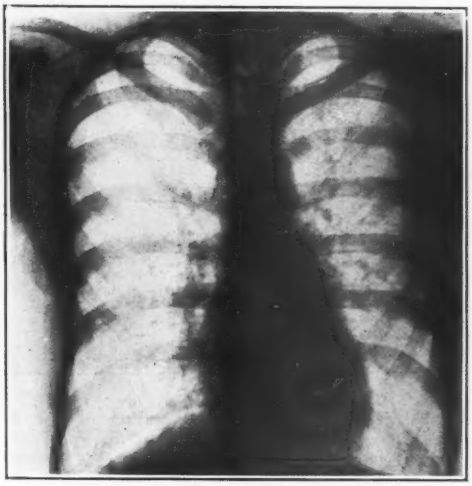

FIG. 8.—*Case V.*—Bronchiectasis. Before injection.

denced by the fact that in spite of its presence in the lung for considerable time as demonstrated by x-rays, it produces scarcely any cough in the normal individual. It is as yet too early to say whether it influences favourably the quantity of pus in bronchiectasis. Sufficient time has not elapsed to justify an expression of its beneficial therapeutic effect. No cocaine intoxication following the use of the anæsthetic has been noted in over two hundred bronchoscopic examination and treatments for bronchiectasis.

The x-ray diagnosis of broncho-pulmonary conditions by means of lipiodol injections is of great value by virtue of the marked contrast which exists not only between radiograms taken before and after injection, but also between the normal and the diseased lung. It opens up a new field in the study of normal and pathological bronchi. Pathological changes can be seen at a glance. Positive diagnosis of bronchiectasis has been made possible.

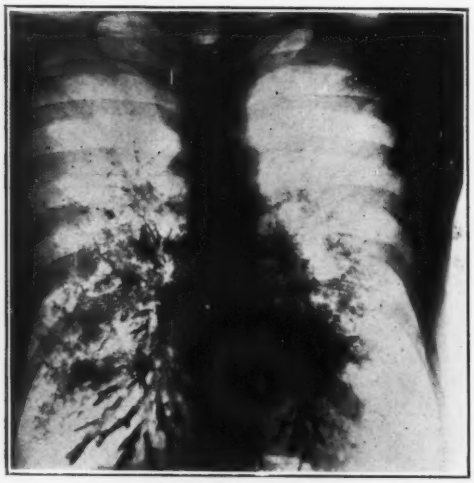

FIG. 9.—*Case V.*—Thirty cc. lipiodol injected in both lungs. In the right lung the injection has reached part of the upper arborization, the middle lobe and the inferior lobe from the hilum down. The broncheoles at the bases show irregularity in outline, and are slightly club shaped. Instead of fine bronchial arborizations down to the diaphragm the picture resembles broken off branches showing bronchial dilatations. The injection has reached the alveoli of the middle third of the left lung and the bronchiectasis is decidedly less marked in the inferior lobe.

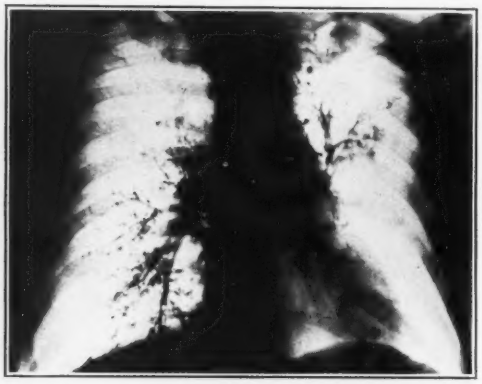

FIG. 10.—*Case VI.*—Bronchiectasis. Twenty cc. lipiodol injected. Tremendous dilatation of the left bronchus. In ordinary x-ray the heart shadows would in a great part obliterate the picture of the enlarged bronchus, whereas with the lipiodol injection it is clearly defined. On the right side the descending bronchi are well defined and show very few pathological changes.

FIG. 11.—*Case VII.*—Bronchiectasis. Twenty-five cc. of lipiodol injected in both lower lobes. The picture shows how the lipiodol by coughing was disseminated to the parenchyma of both lungs. It is valuable in demonstrating how medication could be projected throughout the lungs.

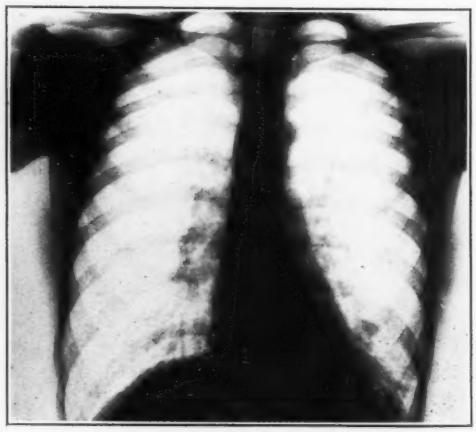

FIG. 12.—*Case VIII.*—Bronchiectasis and Lung Abscess. Before injection.

It bids fair to become also a valuable aid to the thoracic surgeon, and it is hoped that it will permit of the early localization of lung abscesses. We have reason to expect an early diagnosis and early operation in cases of bronchiectasis when one lobe only is markedly involved and the others are fairly normal. It will probably assist the surgeon materially in the selection of suitable cases for operation in pulmonary tuberculosis, and indicate clearly the successful or non-successful result of his treatment and whether there is a necessity of further operative interference. It will also assist in elucidating the cause of a persistence of certain symptoms as illustrated in Dr. Archibald's cases of pulmonary tuberculosis following thoracoplasty. It will demonstrate associated conditions such as bronchiectasis and pulmonary tuberculosis, and will aid in the diagnosis of sub-

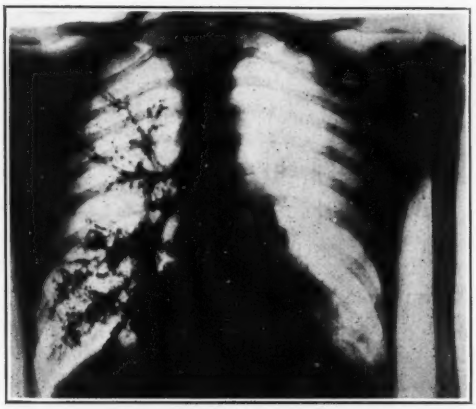

FIG. 13.—*Case VIII.*—Twenty-five cc. lipiodol injected in right lung. Small bronchiectatic areas in the upper arborizations. The inferior lobe shows an abscess the size of a large egg, which was invisible by the x-ray before the injection.

diaphragmatic abscess, interlobar empyæma communicating with a bronchus, new growth, and other similar conditions.

Lipiodol is eliminated from the lungs either by coughing or by absorption from the alveoli; it has been reported to remain in the lung as long as two months. In one patient of our series with chronic bronchiectasis half the the lipiodol was eliminated in twenty-four hours and the lungs were clear in one week. In one normal case the lungs were clear in two weeks, the absorption taking place through the alveoli as there was no cough. In one of Dr. Archibald's

FIG. 14.—*Case VIII.*—Lateral view.

cases with a lung fistula the lipiodol ran through the fistula across into the normal lung and was still present after three weeks.

Dr. Archibald and myself are making further studies with this method. The present study includes illustrations of lipiodol injections of the normal lung, the bronchial tree, bronchiectasis, lung abscess and pulmonary tuberculosis after thoracoplasty.

In conclusion I wish to express my appreciation and thanks to Drs. Pirie and Brooks of the x-ray department for their co-operation.

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X-RAY DEMONSTRATION OF PULMONARY CHANGES IN TUBERCULOSIS BY LIPIODOL INJECTION

EDWARD ARCHIBALD

Surgeon-in-Chief, Royal Victoria Hospital, Montreal

THE French, who have always been to the fore in the field of pharmaceutical products, have recently given us a most valuable substance, lipiodol, the chief use of which hitherto has been to render visible in the x-ray plate the interior of body cavities, in a way quite impossible to obtain with the ordinary opaque substances previously employed. Its value lies in the fact of its being entirely non-irritating. Dr. Ballon, in an article appearing in this issue, reviews the literature of the subject. The object of the present communication is merely to refer to the use of lipiodol in demonstrating cavities and bronchiectasis in tuberculous lungs. The histories of three patients will be given, all of whom had undergone, from two to three years previously, the operation of total posterior thoracoplasty. After improvement lasting a variable period the symptoms of cough and increased sputum reappeared. In such cases the effect of extensive rib removal, with reformation of new bone, irregular outline, and with also a considerable thickening of the pleura such as usually occurs, is to obscure the x-ray plate with such a dense and uniform shadow that the detail of lung structure cannot be made out either in the ordinary plate or in the Buckey diaphragm plate. Neither can we get help from the ordinary methods of physical examination. The compressed lung and the general thickness of the tissue prevent any precise interpretation of whatever sounds may be heard. Under these circumstances any method which can reveal the actual condition present must be of considerable value, either for casting a prognosis or for planning the lines of treatment. Difficulties of this sort confronted one particularly in the three cases mentioned, and it may be said that the injection of lipiodol, performed very skilfully by Dr. Ballon, at my request, afforded us information that was both new and necessary.

Without further preamble I shall now relate the essential facts of the case records.

Case 1.—Miss K. W. Age thirty-five. This patient was referred to me for thoracoplasty by Dr. Woods Price, of Saranac Lake, N.Y.. Her illness began in June, 1920, with a pleurisy on the right side. By November cough and expectoration had appeared, and in February, 1921, upon the occasion of a bout of fever, the diagnosis was made and she was sent to Saranac. She did fairly well for about a year, but in February, 1922, a change for the worse occurred. From that time until October 5th, the date of her admission to the Royal Victoria Hospital, except for a short period of improvement during May and July, she suffered more or less continuously from night sweats, with occasional chills, fever from 100° to 103°, and a pulse of 100 and over. Sputum increased to four boxes in twenty-four hours, and cough was very frequent and troublesome. She was steadily going down hill. X-ray examination showed a dense uniform shadow over the whole right side in which no detail could be made out. The left lung was sound, save for slight and old trouble at the apex. Extrapleural thoracoplasty was done in two stages, on October 11th and October 31st, removing portions of the tenth to first ribs inclusive, thirty-five inches of rib in all. She made a splendid recovery and was discharged on November 21st. Cough was almost abolished, sputum was not over half an ounce, she felt very well, had a good appetite, her toxæmic cyanosis had given place to a good red colour of the mucous membranes; she had gained weight and was enthusiastic about the change in her condition.

This marked improvement continued for over two years, although the amount of sputum gradually increased to between one and two ounces. In the third year, however, she began to lose slightly. Some cough returned, sputum increased somewhat, and she began to have a little fever at times. From about February, 1925, to the end of the summer, it was clear that she

was very gradually losing. Late in August, she was readmitted to the Royal Victoria Hospital for further examination. A lipiodol injection was carried out by Dr. Ballon, and the findings are seen in the accompanying photographs (Figs. 1 and 2, Case 1). The picture in our interpretation shows (best seen in the lateral view) a conglomeration of dilated bronchi, bronchioles, and probably a number of small cavities In the antero-posterior view these are aggregated so as to form, in the main, one dense, somewhat linear, shadow, with trailing out-runners of dilated bronchi. The region affected would appear to be chiefly the upper part of the lower lobe, and somewhat close to the hilus. At the original operation the lower lobe was much less compressed than the upper, and the question arises how much of the present condition is due to a gradual *new* invasion of the insufficiently compressed lower lobe, or how much to the gradual extension of disease originally present there. The point is of importance as indicating, perhaps, the necessity of greater efforts to secure a thorough and complete collapse of the lower lobe. This practically would strengthen the argument for a routine preliminary phrenicotomy, and for shortening the interval as far as possible between the two stages.

Case 2.—Miss M. D. Age thirty-nine. Referred by Dr. Malcolm Lent, of Saranac Lake, N.Y., in November, 1922. This patient's illness began in November, 1919, but it was not until August, 1921, that the disease was recognized, and she was sent to Saranac, where Dr. Lent found extensive involvement of the left lung, while the right lung was clear. Through

FIG. 1.—*Case I.*—Lateral view.

FIG. 3.—*Case II.*—Lateral view.

FIG. 2.—*Case I.*—Antero-Posterior view.

FIG. 4.—*Case II.*—Antero-Posterior view.

the year 1922 she gained steadily. The picture was complicated by both laryngeal and colonic tuberculosis, quite definitely diagnosed, but she overcame these. On admission, November 9, 1922, to the Royal Victoria Hospital, she was found to have an extensive involvement chiefly of the upper lobe of the left lung, with a cavity about the size of a small hen's egg in the apex; there was also some consolidation in the lower lobe. Otherwise she was in good condition. Thoracoplasty was done on November 14th and November 25th. She made a good recovery and was discharged December 23rd. From that time to the present she has remained generally very well, and was on unlimited exercise, but some small amount of cough and sputum, though without bacilli, persisted. She returned in September, 1925, for investigation. A lipiodol injection, as shown in the accompanying photographs, demonstrates the continued presence, or more probably the later development, of a fairly large cavity situated in the upper part of the lower lobe, and also of some slight bronchiectasis in the upper lobe adjacent to the hilus. It is considered that further operation for the compression of this cavity can reasonably be undertaken, in view of her excellent general condition.

Case 3.—Mrs. G. D. Age twenty-nine. Referred by Dr. Roddick Byers. This patient was admitted June 9, 1923. Her illness had lasted two years. Her right lung was extensively involved, chiefly in the upper and middle lobes. Sanatorium treatment had failed to stop the gradual spread of the disease through the right lung. The left lung was fairly good. Thoracoplasty was done on June 14th and June 29th, 1923. She was much improved for about six months but after January, 1925, as the result of giving up treatment and taking many liberties, the disease in her good lung took on activity. She was readmitted in September, 1925, and was found to be in the full flush of active tuberculosis. A lipiodol injection showed a cavity in the compressed lung, in the upper lobe. If it were not for progressive disease in the good lung it would be possible to consider a further operation for the collapse of this cavity.

FIG. 5.—*Case III.*—Antero-Posterior view.

Comment.—This is, one may believe, only a beginning. The demonstration of residual lesions after thoracoplasty, the localization of which is made accurately by stereoscopic and lateral plates, is hardly possible by any other method. It allows one to determine whether further operation is justifiable or not. If a further operation is attempted (and of this we have as yet very little experience) the method will allow of some reasonable control of the results obtained. In addition it ought to be possible, in cases that come up for an opinion as to the advisability of thoracoplasty, when the ordinary x-ray pictures give us no detailed information about the condition of the lung, owing to dense shadows, to demonstrate with lipiodol the presence, or absence of cavitation and bronchiectasis. One looks forward also to its use in differentiating between localized pneumothorax and intrapulmonary cavity, a distinction which is frequently difficult to make. The problem of annular shadows may, in some measure, be resolved by this method. These are a few of the possibilities; others will doubtless appear with increasing experience.

ON SOME ASPECTS OF THE CULTURAL STUDY OF THE RINGWORM FUNGI*

J. F. BURGESS, M.B.

Lecturer in Dermatology, McGill University

Assistant in the Dermatological Clinic, Montreal General Hospital

THIS paper is concerned, primarily, with the cultural methods which are now in use in the Dermatological Clinic of Professor G. G. Campbell, Montreal General Hospital, for the isolation and identification of ringworm fungi.

In the large majority of cases, cultures are not necessary to establish a clinical diagnosis of ringworm infection. A diagnosis may be made, as a rule, by consideration of the clinical appearance of the lesion alone, but the clinical diagnosis should be confirmed in every case, if possible, by a microscopical examination for the presence of fungi in the lesion. There are, however, certain definite clinical manifestations of ringworm infection, as, for example, the trichophytic granuloma, in which it is difficult, and, at times, impossible, to demonstrate the mycological origin of the lesion. Here the cultural demonstration of the fungus is of value.

The microscopical examination of suspected material, i.e., hair stumps or scales, after treatment in 15 per cent. potassium hydroxide solution, enables one to classify the fungus into one of four large groups, namely Microsporon, Trichophyton, Epidermophyton, and Achorion.

A *Microsporon* infection is characterized by the presence of round spores, 3-4 μ in diameter. These spores are very numerous and are arranged in a mosaic about the affected hair stumps. Intra-trichal mycelium may be demonstrated in the shafts of the hairs.

The *Trichophyton* on the other hand, forms spores which are arranged in chains. These spores may be round, oval or oblong, and vary in size from 3-4 μ to 5-7 μ in diameter. If the chains are limited entirely to the shaft of the hairs, we are dealing with an *endothrix* type. The *ectothrix* variety grows especially upon the surface of the hairs.

The *Epidermophytons* of which there are several varieties, are responsible for some ringworm infections of the groin and feet, and are found in the scales obtained from the lesion, as wavy segmented strands, which here and there are broken up into short spore-like elements. The Epidermophytons, curiously enough, have never been known to attack hair. They only grow in the epidermis, the reason for which is not known.

The *Achorions*, the fungi which cause favus, appear as very irregularly segmented spore-like elements in the material obtained from the cups or *scutulæ* which are so characteristic of this condition.

Experience has taught us that it is important to obtain the right material for cultures. Hair stumps, preferably taken from a dry locality and free from exudate, scales at the border of a lesion, or the roofs of vesicles where they are present, offer the best material for culture work. We put the material obtained in sterile tubes plugged with sterile cotton. Where this material is moist, or from the character of the lesion it is probable that secondary infection is present, as, for example, where pus is found, it is a good plan to allow the material to dry in the test tubes for four or five days or more, before making cultures from it.[1] Hair stumps or scales are divided into very small pieces by placing them on a sterile glass slide, and sectioning them with a sterile razor blade. The pieces are then planted on the surface of 6 per cent. glycerine agar, 5-6 pieces to each tube. Numerous plants, especially when one is dealing with scales from moist areas, may have to be made in order to ensure a pure growth of the fungus. We have occasionally been unable to obtain a positive culture even where there appears to be no restraining cause for the growth of a fungus. The inoculated tubes are plugged with cotton and left at room temperature. The great

*From the Departments of Dermatology and Pathology, Montreal General Hospital. Assisted by a grant from the Cooper Memorial Fund, McGill University.

FIG. 1.—*Microsporon Audouinii* forty day culture on Sabouraud's glucose agar. This fungus is the most common cause of scalp ringworm in children.

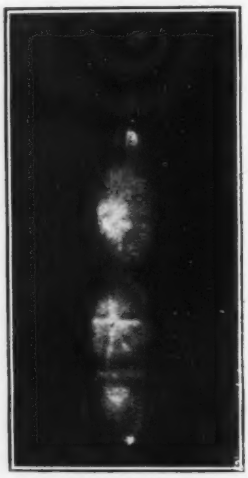

FIG. 2.—*Microsporon Audouinii* twenty-five day culture on Sabouraud's glucose agar in test tube.

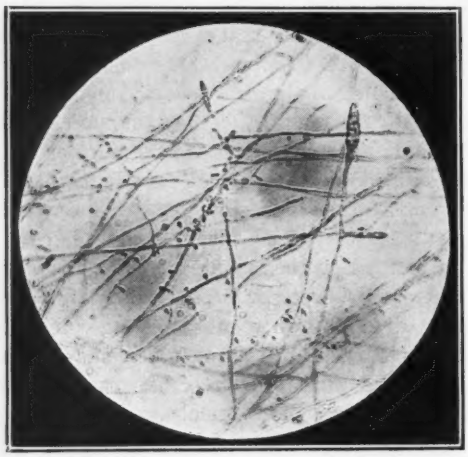

FIG. 3.—Hanging drop preparation to show the morphological structure of the *Microsporon Audouinii*. Shows sporiferous hyphæ and fuseaux (one fully developed).

majority of the known varieties show a growth visible to the naked eye in four to six to twenty days. Some rarer types, such as the *Trichophyton faviforme*, do not appear in culture for two months or even longer. With the precautions referred to above, one frequently obtains pure cultures of a fungus on the first inoculation. Occasionally, even after the greatest care, bacteria or moulds may develop on the surface of the media, and make it necessary to take special measures in order to isolate a pure culture. It may be necessary to break the test tube, and attack the growth from the under surface of the media in order to obtain pure transplants.

There is a striking difference between the fungi as they appear in the lesion, and when they are grown on cultural media. The growth on cultural media is much more luxuriant than it is in the lesion itself, and they differ greatly in their morphological characters. This differ-

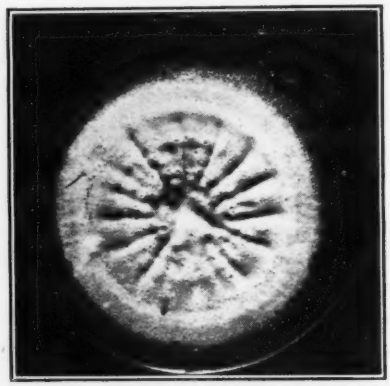

FIG. 4.—*Microsporon lanosum* thirty-five day growth of original culture on Sabouraud's media. A rapidly growing, animal microsporon and a most common variety causing ringworm in Montreal.

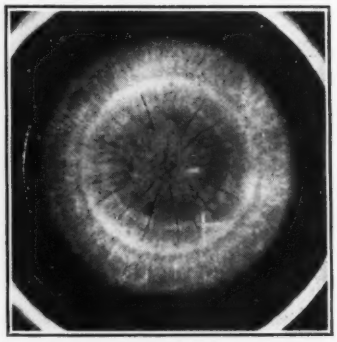

FIG. 5.—Pleomorphic variety of the *Microsporon lanosum*.—forty days' growth in dessert dish, on Sabouraud's media.

ence may be readily understood if we take into consideration the difference in their environment, and realize at once that ringworm fungi are wonderfully adaptive vegetative organisms. Even slight changes in the composition of laboratory culture-media will affect the character of their growth. Because of this it is necessary to use a standard medium on which to compare them. For classification purposes, Sabouraud[2], the father of our present knowledge of ringworm mycology, elaborated a four per cent. glucose agar, his "*media d'epreuve*"* for their isolation and identification, and evolved a system of classification based partially upon their growth on this media. It has been pointed out by Weidman[3] that it is necessary to use imported French peptone (Chassaing) in the preparation of the media rather than American peptone, as French peptone contains certain organic impurities which give a high degree of acidity to the media, and yield growths of these fungi which, by their luxuriance and other characteristics, closely approximate those obtained and described by Sabouraud.

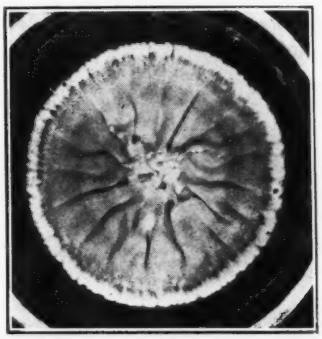

FIG. 6.—A second pleomorphic variation of the *Microsporon lanosum*. Forty days' growth in dessert dish on Sabouraud's media.

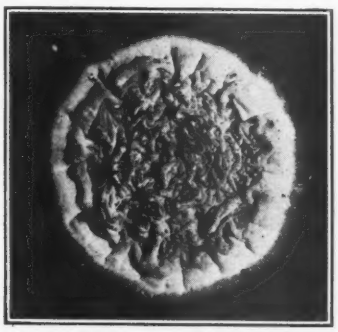

FIG. 8.—*Trichophyton endothrix plicatile* causes large spored ringworm of the scalp, and also gives rise to lesions of the glabrous skin.

FIG. 7.—*Trichophyton endothrix. violaceum*. A smooth, slowly growing culture showing many fine pleats, and of a deep violet colour. A cause of black dot ringworm of the scalp.

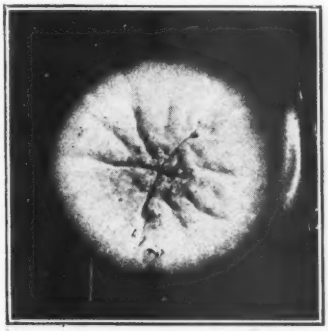

FIG. 9.—*Trichophyton gypseum*. An estothrix variety, frequently causing pustular folliculitis of the scalp. The surface of the culture is furrowed and finely powdery.

In studying colonies of ringworm fungi it is necessary to have a larger surface for growth than that afforded by ordinary test tubes. (Compare Figs. 1, 2, 11, and 12). For this reason we use 300 cc. Erlenmeyer flasks: 60 cc. of media in these flasks give a growing surface about 10 cm. in diameter. We have further employed ordinary dessert dishes[4]. Growths in these dishes have several advantages, one of which is that they permit of direct examination of the growth from above, and are therefore valuable for demonstration purposes.

Many of these ringworm fungi, after a varying period of growth on laboratory media con-

*The formula of Sabouraud's glucose agar is:
Glucose (chemically pure) 4 grams.
French peptone (Chassaing) 1 gram.
Agar 3 grams.
Distilled water 100 cc.
Imported French peptone (Chassaing) may be obtained from Edward P. Dolby & Co., 3621 Woodland Avenue, Philadelphia, Pa.

taining carbohydrates, undergo pleomorphism. This is shown by the appearance of white, woolly, down-like tufts, growing here and there on the surface of the culture. (See Figs. 4, 5, 6, and Figs. 11, 12 and 13). With further development these pleomorphic forms not infrequently entirely replace the original culture. Transplants from pleomorphic colonies always yield the pleomorphic variation, never the type of the original culture. As shown by Sabouraud, pleomorphism may be prevented by using a culture medium that is free from carbohydrates. For this reason, in order to preserve the characteristics of the original growths, we employ Sabouraud's *"media de conservation,"* a three per cent. peptone agar.† This medium is also of value in differentiating certain varieties.

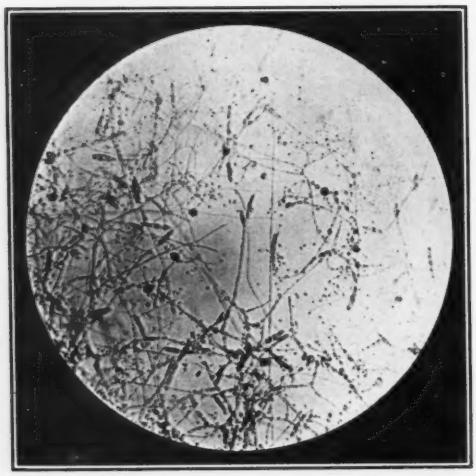

FIG. 10.—Hanging drop preparation to show the characteristic spore forms of the *Trichophyton gypseum*, type asteroides. Shows small spores arising from sporiferous hyphæ, a few terminal and intercalary Chlamydospores, and many multilocular fuseaux.

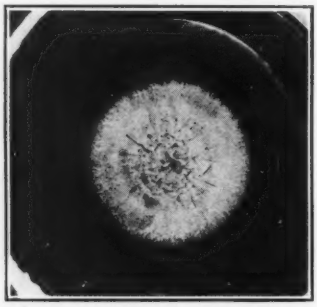

FIG. 11.—*Epidermophyton inguinale*—original culture on Sabouraud's glucose agar at forty-five days.

The pleomorphic variation referred to above represents a reversion from a highly differentiated type to reproduction in a more primitive one. Sporulation of the pleomorphic variation takes place by means of simple oval, or round spores on a sporiferous hypha and the more complicated forms that one commonly sees in ordinary cultures are not found.

The morphological structure of growths of fungi may be studied either by means of stained or unstained preparations. We have found that hanging drop preparations are the most satisfactory way of studying them. In the hanging drop preparation we use four per cent. glucose bouillon as the culture medium. Such preparations may be satisfactorily made in the following way: a rubber washer of a type which may be obtained in any hardware store, with an inside diameter of about 1½ cms. is sterilized by boiling, and fixed to a sterile glass slide by means of sterile vaseline which has been placed on one surface of the rubber ring. The other surface of the ring is smeared with sterile vaseline. A drop of glucose bouillon is placed in the centre of a sterile glass slide, preferably a thin one, and is

FIG. 12.—*Epidermophyton inguinale.* Showing beginning pleomorphic degeneration in right tube. The left test tube shows the original culture entirely obscured.

†Sabouraud's 3% peptone agar has the following composition:
Peptone 3 grams (Chassaing).
Agar 2.5 grams.
Distilled water 100 cc.

inoculated with a very small portion of the culture to be studied. This slide is then quickly inverted and pressed down on the washer at right angles to the glass under slide. By this method the medium is enclosed in an airtight chamber. On account of the possibilities of drying and failure of growth to develop in a certain percentage of cases, it is important to make at least ten to fifteen of these hanging drop

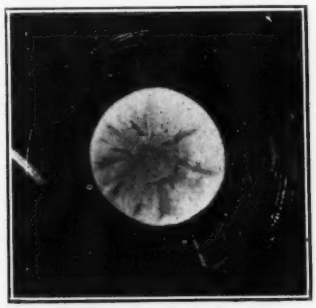

FIG. 13.—*Epidermophyton inguinale*, pleomorphic variety. Thirty days' growth on the media of Sabouraud.

preparations for each fungus studied. It is also advisable to select the material for inoculation from a freshly grown, fairly well-developed colony. These hanging drops, when properly prepared, will keep for two or more months, and may be examined from time to time under a microscope without disturbing the growth. There is the very definite advantage of being able to watch the development of the fungus under consideration and to study easily their reproduction forms. See Fig. 3 and Fig. 10.

Of value in classification is the experimental inoculation of a fungus in laboratory animals. The guinea-pig is very suitable. A number of areas should be slightly denuded of hair, and agar portions of a freshly grown, well developed culture rubbed into the skin. Usually, where the fungus is pathogenic for guinea-pigs, in a few days, seven to twelve, crusted scaly lesions develop, in which the fungus may be readily demonstrated. These lesions clear up spontaneously in thirty to forty days. The animal inoculation is of especial value in determining whether the fungus under question is a Trichophyton or Epidermophyton variety.[5]

Besides their clinical value, cultural studies of ringworm infection assist one in forming a clear conception of the lesions they produce, and add an interest and afford a satisfaction

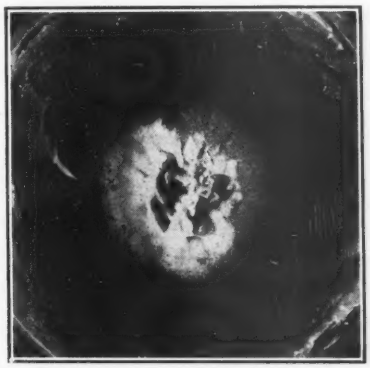

FIG. 14.—*Achorion Schonleinii*, the cause of favus of the scalp. Sixty day culture on Sabouraud's glucose agar.

that comes only with the complete investigation of a case.

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Pulmonary Tuberculosis: Prolonged Rest and the Absorption of Deposits.—Gerald B. Webb, Colorado Springs, Colo., insists that rest in pulmonary tuberculosis should be prolonged many months after the temperature and pulse have become normal and sputum has disappeared. Tuberculous deposits start to clear away after six months of rest, but may not be completely absorbed until from two to three years of rest. —*Jour. Am. Med. Ass.*, September 19, 1925.

FAMILIAL ICTERUS GRAVIS OF THE NEW-BORN AND ITS TREATMENT

A. P. Hart, M.B.

Assistant Physician, Hospital for Sick Children, Toronto, Ont.

IT is to Abt that the credit is due for first calling the attention of the American profession to this rare form of disease in 1917. Pfannenstiehl, however, gave the first detailed description of familial icterus of new-born children. He described two fatal cases and collected the scattered reports in the literature in 1908. More recently Klemperer, in 1924, gave an admirable detailed description of the pathological findings of three cases, two of which were quite typical of this condition.

It was my fortune to be called by Dr. Murray, of Parkdale, to see the case which is the subject of this paper a few hours after the baby was born on December 18, 1924. The baby was a perfectly healthy looking, fine specimen of male child weighing between eight and nine pounds. The family history, however, was so remarkable that one was prepared for trouble. As the father informed me, they had had six boys born previously all apparently as healthy and strong at birth as this baby. They all, however, had developed jaundice within the first twenty-four hours, and the condition had become progressively worse until death occurred in from three to eleven days. They had only one child living, a girl who was the second child born to the family. She had become jaundiced as the others and although it was felt that she was going the same road as they had gone, she had managed to live although deeply jaundiced until one year old and weighing at this age only what she had weighed at birth. After a year the jaundice gradually disappeared and she grew very rapidly so that she is now at twelve years a very big girl for her age but suffering with chorea. There was absolutely no history of jaundice in the family on either the paternal or maternal side and both parents were perfectly healthy. There was no specific history. There had been no miscarriages. The baby was a well developed male child, two hours old, and so far as one could find, perfectly healthy and at this time with no sign of jaundice. On the second day, the father stated that he could see jaundice beginning to appear on the tip of the nose but as it was evening and only artificial light could be used I could not see it myself. On the next day, however, the baby being then forty-eight hours old, he was distinctly jaundiced. The liver was not enlarged and as the jaundice was no more intense than ordinary icterus neonatorum, I found it difficult to be sure that it was a more serious condition. During this time the baby was taking the breast vigorously every four hours and taking large quantities of water between nursings as instructed on the first day. The stool was still meconium. On the third day, the jaundice had become much more intense so that the skin was a deep orange colour. The pupils were equal, the sclerotics had a distinctly yellow tinge and the baby tended to be drowsy. The tongue was furred, the gums and throat clear. The hard palate showed a yellow tinge. The abdomen was flaccid and the liver just palpable at the costal margin. The spleen was not enlarged and the umbilicus was perfectly clean. The respiratory and circulatory systems were normal. The *blood examination* showed as follows: Red blood cells 4,200,000; white blood cells 9,000; hæmoglobin 85 per cent.; polymorphonuclears 68 per cent; lymphocytes 32 per cent. The blood film showed no abnormality of the red or white cells. Unfortunately, although it had been asked for, by a misunderstanding the bleeding and clotting time was not done. *Fragility test,* point of minimal resistance 0.45 saline, point of maximum resistance 0.25 saline, which are within normal limits. *Van Der Bergh's test,* direct test negative, indirect test strongly positive. This together with a normal fragility test would seem to indicate damage to the liver cells. The stools which were losing the nature of meconium looked as though they contained bile and the Gmelin's test for bile was strongly positive.

The urine also contained bile. The blood culture was sterile and the temperature had not been above normal since birth.

It was quite certain that we were dealing with a case of familial icterus gravis but on looking up the literature upon all the reported cases one could find very few helpful suggestions for treatment. Klemperer who described the pathology so admirably suggested that one should try to protect the liver against destruction by sustaining its glycogen reserve. He concluded that the beneficial results of glucose transfusion in mushroom poisoning, (Treupel and Rehorn) and in the toxæmia of pregnancy (Titus and Givens) which aim towards the same point, suggested the same therapy in cases of severe jaundice in the new-born. His pathological findings in the two cases which seemed clinically from their history to belong to this group, showed in the first case a diffuse not a focal necrosis and destruction of the liver cells, most conspicuous but not limited to the central areas of the lobules. Fatty changes were present in this case but only to a moderate extent. He pointed out the similarity to the pathological findings in acute yellow atrophy. However, he could not be absolutely certain that some of the changes might not be due to an umbilical infection in his first case, as there was some slight clinical evidence of a navel infection, although the anatomic and histologic examinations furnished no confirmatory evidence of this. His second case showed more extensive fatty changes with bile duct proliferation and reparation of liver cells in the periphery. His third case he concluded himself was not a case of familial icterus gravis, but a case of icterus neonatorum. In none of his cases were there any signs of obliteration of the bile ducts. These two cases together with the two cases which Abt had reported were the only ones which I was able to find in the American literature.

Abt states that the cause is unknown, that the disease has nothing in common with Buhl's or Winkel's disease, and that there is nothing to prove that familial icterus gravis is due to a septic process. He further states that there is no history of birth injury nor does it seem to be due to any toxæmia of pregnancy. He draws attention to the fact that most of these children are strong, robust and mature at birth but in a sense they appear to be physically defective and very soon become incapacitated to carry on extra-uterine existence and that it is possible that the liver fails in the performance of its extra-uterine function. After a good clinical description he concludes by stating that the disease is of unknown origin, is nearly always fatal, and recommends no treatment.

Knopfelmacher is inclined to think that some septic process is involved to explain this group of cases. He considers that the habitual occurrence of the disease in the same family was not sufficient argument against the consideration of sepsis and is of the opinion that a chronic infection of the vaginal portion of the birth canal of the mother might serve as the origin of infection in successive cases.

Rolleston thinks that the toxæmia of pregnancy might be a cause. He found that out of twenty-five family groups which he had collected—that was in fifteen out of one hundred and thirty cases of newly born infants with familial icterus gravis, the mothers had recurrent jaundice during their pregnancies. It was interesting to note that all of these cases went to full term. He points out that the disease appears to be less likely to attack the first and second born than the later infants in the families affected. He gathered from the literature that in fourteen out of twenty-five families collected the first-born escaped, and in several families the first-born was slightly jaundiced and was the only one to recover. He stated that there was no evidence that syphilis plays any part and no good reason for regarding infection as a cause. In the cases which he had collected there were thirty-one males and thirty-one females so that it would not appear that sex was a factor.

Discussion.—Regarding Rolleston's suggestion that the disease is due to toxæmia of pregnancy, there is nothing to suggest it in this family. The mother was never better in her life than she was during this pregnancy. She had no signs of any jaundice and has never had any. She had no headaches and the only trouble she had was some cramps in her legs. Also in this case there was no sign of sepsis or infection of any kind. The mother had no sisters but her brothers had normal children. The father's brothers and sisters also had normal children. There was no evidence of syphilis. It would look as if, from the results of the treatment to

be described later, and the course of the case, that the condition was due to some unknown toxin circulating in the blood and possibly absorbed from the gastro-intestinal tract.

Clinical features.—Briefly reviewing the clinical features of familial icterus gravis we have an afebrile form of jaundice which is peculiar to certain families and tends to occur in successive pregnancies. The children when born appear to be quite normal but die a few days after birth as the result of a grave and progressive icterus. As a rule there is no hereditary influence. Nothing of a similar nature is discovered in the family of the father or mother. The disease begins on the first or second day of life and rapidly increases in severity. The stools may be slightly loose and contain mucus. They are not acholic. The urine usually contains bile pigment. Sometimes the liver and spleen are enlarged. If treatment is not instituted the jaundice becomes progressively more intense, the baby becomes drowsy, and frequently signs of meningeal irritation develop with characteristic crying and whining (all the cases in this family which were allowed to progress developed these latter symptoms). Death follows in a few days from collapse.

Diagnosis. — Simple, physiological or idiopathic jaundice has been estimated to occur in 33 per cent. and upwards of all birth. The jaundice begins within the first two days and appears earlier than in the cases of grave infective jaundice. There are no symptoms although sleepiness is mentioned by Langmead. It is differentiated from this rare condition of familial icterus gravis by the family history and the course of the case. No treatment is necessary.

Congenital obliteration of the bile ducts is accompanied by hepatic and splenic enlargement and practically always proves fatal within eight months. It is therefore relatively chronic as compared with familial icterus gravis. The first case of familial icterus gravis in a family would be difficult to distinguish from this, although hepatic and splenic enlargement with acholic stools would be in favour of gross obstruction.

In severe infective forms of jaundice, such as those due to umbilical, cutaneous or intestinal infection, the jaundice comes on about the fifth day of life, later than in familial icterus gravis, and is accompanied by signs of grave septicæmia, high fever and hæmorrhages especially from the umbilicus or alimentary canal. Winckel's disease and Buhl's disease are manifestations of this septicæmia of the newly born, in which the infection probably enters from the intestine.

Acholuric family jaundice runs a mild course. There is an hereditary history and the spleen is enlarged. It is recognized by the characteristic fragility of the red blood corpuscles.

Congenital syphilis does not often cause jaundice. It usually comes on early and is accompanied by other signs of the disease.

Sometimes in hæmorrhagic disease of the new born jaundice is present, but in these cases the bleeding is the outstanding symptom which will serve to differentiate it.

Prognosis.—The prognosis has always been given as bad. Out of one hundred and thirty cases collected by Rolleston, one hundred or 77 per cent. proved fatal.

Treatment.—As stated earlier, in going over the literature, one could not find many suggestions for the treatment of these cases. Rolleston suggested prophylactic treatment of the mother on the hypothesis that the condition was due to a fœtal toxæmia of maternal origin. It was too late to do anything of that nature and one could find no evidence of any toxæmia of pregnancy in this case. He also suggested small doses of calomel for the infant but the child was becoming so rapidly worse that one did not feel that calomel would have any material effect. Since in this case there was no evidence of infection or sepsis it seemed as though the condition must be due to some toxin circulating in the blood which was destroying the liver cells, and as both the parents and I felt that if something drastic was not done at once the child was certainly going to die as the six other previous male babies had done, it was decided to do an exsanguination transfusion after the technique brought out and perfected by the late Dr. Bruce Robertson, in the hope of removing a sufficient amount of toxin to prevent the progress of the disease. The baby was in Group II Jansky. Dr. J. L. MacDonald, of the Hospital for Sick Children exsanguinated three hundred cc. of blood from the anterior fontanelle at the same time transfusing 335 cc. of blood into the internal saphenous vein at the left ankle. The transfusion of blood was commenced after 20 cc. of blood had been removed

and the transfusion and exsanguination went on synchronously until the required quantity had been used, and we ended by giving the baby 35 cc. more than had been removed. In addition 60 cc. of 5 per cent. glucose solution were given. The donor was a healthy male not belonging to the family. By the following morning the jaundice was much less intense. It continued to fade so that by the fourth day it had entirely disappeared and the baby seemed much better. When three weeks old there was a slight return of jaundice. Preceding this he had been constipated. This slight return of jaundice had entirely disappeared four days after it was first noted and when the constipation had been corrected. He has had no return of the jaundice since and is gaining and developing at five and a half months as any normal baby—weight seventeen pounds. He is still on the breast so that it would hardly seem as if the mother's milk were a factor. I should like to point out that transfusion without exsanguination had been done to Klemperer's three cases but apparently without much benefit.

Conclusions

1.—It would appear as though familial icterus gravis of the newly born were due to a toxin of some unknown origin operating upon the liver in certain rare families.

2.—The return of the jaundice in the case cited following constipation suggests the possibility of absorption from the intestine being a factor in these cases.

3.—Early exsanguination transfusion before the liver cells have been too extensively damaged would seem to cure the condition if a sufficiently large exsanguination transfusion be done.

4.—The possibility of beneficial effects from the administration of glucose should be considered as an auxiliary.

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A Typhoid Carrier.—The patient whose case is cited by C. B. Sylvester and A. W. Sylvester, Portland, Me., was a typhoid carrier for twenty-nine years. It is to be noted, as evidence of his personal neatness and cleanliness, that for nine years he worked in a hotel without knowledge of typhoid resulting. The intimate associations of family life were promptly and dramatically productive of disease. The case is a valuable testimonial to the localization of *B. typhosus* in the gallbladder. It is also made evident by an investigation of submucous tissue in the gallbladder that any treatment short of removal must be futile.—*Jour. A. M. A.*, July 11, 1925.

XUM

AMŒBIC DYSENTERY IN CANADA

J. E. BATES

Fellow in Pathology, University of Toronto

IT has been repeatedly stated that true dysentery in adults in Canada is an unusual disease, and that amœbic dysentery is rare. The object of this article is to report a case of amœbic dysentery arising in a woman who had never been out of Canada, and to draw attention to the fact that amœbiasis, or the state of being infected with amœbæ, is no longer a rare condition in subtropical and temperate zones.

For a number of years the terms "amœbic dysentery" and "tropical dysentery" were used synonymously. The disease was prevalent, and indeed was epidemic in tropical regions, especially in Southern India and China, in the Mediterranean basin, in South America, and in many of the southern states. It would appear that these tropical, and subtropical regions, have been its normal habitat, and that with the development of navigation and transportation, the disease has made its appearance in temperate climates. Thus, for example, it was not uncommon that sailors returning to England after having been to the tropics suffered an acute attack of amœbic dysentery shortly after their return. In others the attack did not become acute for some time so that at first it appeared that the disease had originated *de novo*. Other individuals returning from the tropics might act as carriers of the *Entamœba histolytica* and excrete them in their stools without they themselves having any symptoms of disease. In this way the spread of amœbic dysentery would be made possible and cases could arise in countries remote from the tropics, so that it is not surprising that a number of cases of this disease have occurred in those who have never been in the tropics, and who live at some distance from them.

In this connection it is of interest to note that as early as 1862 Dickinson reported a case of amœbic dysentery with hepatic abscess in a woman, and in 1881 he reported a second case in a man aged thirty-six, who had never been out of England. Also in the same year, 1881, Moore reported a similar condition in a girl aged three and one-half years who had never been out of London, England. Up to the year 1921 the author has been able to collect case reports of eight individuals suffering from amœbic dysentery who had never been out of England, and one case reported by Marshall in 1912, of a man who had never been out of Scotland. In 1890 Osler was the first to report a case of amœbic dysentery in America in which the amœbæ were demonstrated in the stools. In 1909 Patterson reported cases in twenty-four states, and since that time it has been found in practically all of the states. While the disease is wide-spread in the United States, it has not been reported in epidemic form, but only in isolated cases, in many of which the exact origin of the infection is not known. The problem presented itself as to whether the organisms causing amœbic dysentery in temperate climates were of the same species as those that are pathogenic in the tropics. In an endeavour to gain this information Whitmore undertook a series of studies on the amœbæ of a man who had never been out of New York before his dysentery began, and found that the amœbæ in this case were identical with those occurring in the amœbic dysentery of the tropics. Axtell in 1911 reported an interesting case in which he believed the disease had been contracted in Alaska. Indigenous cases are also on record in Russia, Austria, and Poland. Thus it is evident that the disease is by no means confined to the tropics and consequently the term "tropical dysentery" can no longer be used.

To the stimulus initiated by the accumulation of case reports of amœbic dysentery appearing in temperate regions, an added interest was afforded by circumstances growing out of the recent world war, chief amongst which was the invaliding of dysenteric convalescents to Great Britain from Mesopotamia. Dudgeon and Yorke in 1919 reported the finding of cysts of *E. histolytica* in 12 per cent. of convalescents

from dysentery, and in 7.8 per cent. of patients in military hospitals for diseases other than dysentery. Among persons who had never been outside of Great Britain they found cysts in 1.5 per cent. of civilians, 1.8 per cent. of children under twelve years of age, 6.6 per cent. of recruits at an army camp, and 9.7 per cent. of patients in lunatic asylums. In a group of soldiers returned from abroad in the same camp as the army recruits, they found cysts in 7.8 per cent. They conclude that a considerable percentage (estimated by the Medical Research Council of 1922 at 5 to 10 per cent.) of people who have never been out of England harbor amœbæ. This percentage varies in various groups. It was highest in asylum patients, and next highest in young men, eighteen to nineteen years of age, in whom it reached 5.6 per cent. Indeed Matthews and Smith state that the incidence among asylum patients is greater than among those who have been to the tropics. These authors do not believe that the incidence of *E. histolytica* has been materially increased of late in England but that the amœbæ have been present there for some time. First, they point out that carriers such as traders, sailors, civil service, troops, etc., have constantly been coming there from tropical regions. Secondly, all the factors necessary for the spread of amœbic dysentery are present as is seen by the high percentage, 9.7 per cent. in lunatic asylums, and in certain families it has been found to run as high as 68 per cent. Thirdly, in spite of the fact that few were familiar with the diagnosis of this condition, several cases were on record in England before the war. They believe that although certain classes of the population are heavily infected, very few acute cases are recorded, on account of the fact that some additional factor is required for the disease to develop. In substantiation of this view we have the work of Walker and Sellards in the Phillipine Islands who fed cysts of *E. histolytica* to twenty volunteers, only four of whom developed the disease although eighteen in all became parasitized, that is, they harboured the amœbæ in their bowel and excreted cysts in their stools but exhibited no symptoms referable to this condition. It would appear that in the four who developed the disease some additional factor was present. Regarding the incidence of *E. histolytica* in the United States, Stiles reports its presence in 4.1 per cent. of cases examined in various parts of the country. He does not believe that the incidence has been increased by the world war.

Dobell states that from the most general standpoint the life of an intestinal protozoon consists typically of two main periods, a period of freedom or activity, often called the vegetative stage, and a period of rest. It is characteristic of all the intestinal protozoa that during their period of relative freedom and activity, which is invariably passed within the human bowel, they seem to grow and multiply actively. On the other hand the resting period is always passed outside the human body, within a special protective capsule or cyst. The free forms living and multiplying in the body of man comprise the disease-producing phase, while the resting or encysted forms, capable of external existence, serve to convey infection from one man to another. Infection by any intestinal protozoan is always acquired through the mouth by swallowing a living cyst containing the resting form of the particular organism. Under ordinary circumstances the free forms cannot live outside the body for more than a very short time, and they die if swallowed, not being able to survive the acidity of the gastric juice. In other words, the free forms are not infective. The two periods or cycles of development alternate more or less regularly with one another. When a cyst is ingested it passes intact through the stomach into the intestine. Here it hatches and liberates its contained organisms, which seek their appropriate place in the bowel and there begin their further development. After living and multiplying for some time, their offspring secrete cysts, and then pass out of the intestine with the stools. The cycle of events is repeated if these cysts are swallowed by another individual. This is true for the intestinal protozoa as a whole. The *E. histolytica* has a few traits peculiar to itself. It is a tissue parasite which gains its nutrition from living tissues alone, being unable to lead a saprophytic existence. In the large bowel it lives upon the tissues forming the wall of the gut. The amœbæ lie in contact with the mucous membrane of the bowel whereupon they secrete a cytolytic ferment which dissolves the cells immediately about them. The organism is then able to absorb the cytolyzed tissues which comprise its chief supply of food.

By this process the amœbæ eventually penetrate to the submucosa where by their cytolytic ferments they produce necrosis and burrow widely beneath the submucosa spreading by the lymphatics and veins and producing a distinctive type of ulceration of the colon with undermined edges. In this way the amœbæ are found actually within the wall of the bowel where they were first reported by Koch in 1883. The tissues of the host respond to this injury; an attempt at regeneration is made, and as a rule a state of equilibrium is established between the damage done and the tissue response. Such a state represents the normal condition of infection with *E. histolytica*. The host suffers no harm and the parasite lives its normal cycle. It is when there is lack of harmony between parasite and host that disease, which is mutually harmful to both, develops. In the case of the host the symptoms may be classified into two main groups, i.e., primary or intestinal disorders resulting from irritation of the intestine; and secondary disorders consequent upon the wandering of the parasites from their primary site of infection to other organs, especially the liver. These diseased conditions of man are harmful to the parasite also, for they disturb its food supply, they interrupt its normal life history, and lead to a great wastage and mortality among the amœbæ concerned. In amœbic dysentery, for example, the amœbæ are cast out of the body in large numbers before they can encyst, and consequently they perish and are unable to propagate their species. Similarly in the case of secondary infections of the organs, the parasites are unable to encyst, and even if they could they would be unable to escape to the exterior. It will be clear then that *E. histolytica* is a parasite which is by no means always recognizably pathogenic. It always destroys some tissues of its host, but it by no means always gives rise to any outward manifestations of disease.

It is essential also to note as has frequently been pointed out that a patient suffering from amœbic dysentery and passing large numbers of vegetative amœbæ in the stools is not able to infect others. The free living amœbæ are evacuated along with the diarrhœal stools before they have a chance to encyst, and once outside the human body they perish. Even if they could withstand the unsuitable environment they would be destroyed in the upper gastro-intestinal tract if swallowed by another individual. But in a certain number of apparently healthy individuals, intestinal amœbiasis may exist and the individual may harbour the living amœbæ in the gut wall and pass encysted forms which, if ingested by others, will infect them. Such healthy individuals are termed carriers of *E. histolytica* and have been divided into two groups, the convalescent carrier and the contact carrier—the former having had one or more attacks and having recovered clinically without losing the infection, the latter never having exhibited any clinical manifestations. From this discussion of the communicability of the disease it is seen that amœbic dysentery will not usually occur in epidemic form, although small localized epidemics have occurred. Finny reported a small outbreak in 1896, and Allan has reported in 1909 a small localized epidemic of amœbic dysentery directly traceable to an infected well, a pipe from which passed underneath an army latrine to six houses. It was owing to an outbreak of this disease in the individuals living in these six houses that the point of break in the water system was found.

We know that man acquires infection with *E. histolytica* by swallowing the cysts of the parasite contained in contaminated food or drinking water. Drinking water affords an ideal medium for the carriage of the cysts as it prevents both dessication and intense bacterial action. Boeck has shown that cysts when kept in distilled water at 12°-20° C will live for as long as 153 days. The danger of contamination of food or water may be greatly increased by the activity of flies. In 1917 Wenyon and O'Connor concluded that amœbic cysts could pass successfully through the alimentary tract of the house-fly and be voided with the fæces. In 1920 Buxton found that in a well sanitated area in Lower Mesopotamia, over 60 per cent. of the flies carried human fæces, over 4 per cent. carried actual human entozoa, and at least 0.5 per cent. carried *E. histolytica*. Woodcock in 1918 discounted the importance of the house-fly as a spreader of the condition and stated that in countries where amœbiasis exists the fæces of flies is rapidly dessicated and the amœbic cysts are soon destroyed by the drying of the fly specks in the hot weather, but he points out that in places where the humidity is greater, amœ-

biasis is more common, and moreover, that the incidence varies with variations in humidity throughout the year. He indicates that the incidence in Mesopotamia is greater than in Egypt or Arabia on account of the greater humidity. The importance of sanitation in the prevention of the spread of the condition is thus made evident, and it would even appear that the more frequent occurrence of amœbic dysentery in the tropics is to some extent due to their lack of even a rudimentary knowledge of sanitation.

So far as the author has been able to ascertain, no extensive work has been undertaken regarding the incidence of *E. histolytica* in Canada though its prevalence may have been increased following the late war. A search of the literature reveals only four cases of amœbic dysentery reported in Canada. Two of these may be dismissed at once as having arisen in the tropics. These two cases reported by Gordon in 1916, had been invalided home from the tropics, in one case from Venezuela and in the other from a trip through the West Indies, Trinidad, and British Guiana. Of the other two cases indigenous in Canada, one was reported by Ball in 1892, as having originated in Winnipeg. The individual was a Scotchman who had been in Canada for two years and may have contracted his infection before reaching this country. The other was reported by Finley and Wolbach in 1910 as originating in Montreal in a man thirty-four years of age. No statement was made in the report as to whether he had ever been outside of Canada or not. The following case then, is I believe the third to be reported as having originated in Canada.

M. H., female aged twenty-four. This individual was born in Canada and had never been outside of Ontario. She complained of gradual loss of strength for two months, and of a moderate amount of nausea, vomiting, and diarrhœa which had been present for one month. She had increasing shortness of breath on exertion for the last six months, but had been able to do her own housework till two months before her admission at which time her fifth baby was born. After this she did not regain her strength but felt weak and run-down. One month prior to her admission she had to give up her work and in the last week she has had vomiting and diarrhœa which on one occasion showed streaking of blood. During this last month her appetite has been failing and her chief complaint has been diarrhœa amounting to seven or eight fluid stools of a dark colour each day. The passage of stools was accompanied by pain across the abdomen and her doctor found that they contained blood. As her diarrhœa and weakness did not improve under treatment, and as she became more and more anæmic she was sent to hospital.

On examination she was well developed and fairly well nourished but very pale and anæmic looking. She had a definite malar flush and appeared feverish and quite ill. The heart was enlarged to the left, and there were mitral and aortic systolic murmurs. The abdomen was rounded and moved but little with respiration. No definite rigidity was present but there was well-marked resistance to palpation. There was generalized tenderness over the whole abdomen but more particularly in the flanks, more marked on the right than on the left side. The liver was not palpable.

While in the hospital she passed frequent stools with gross blood, pus, and mucus in small amounts. Microscopically red blood cells, pus cells, and amœbæ which were considered to be non-pathogenic were found. She appeared drowsy and became more toxic and anæmic with a progressive fall in blood pressure so that transfusions of citrated blood were given her. These improved her general condition temporarily but the bloody mucous stools persisted ranging up to sixteen per day and her blood pressure continued to fall. The day before her death she passed large blood clots by bowel. Her pulse which had been irregular became very small and running, at times not being palpable. On the morning of her death she passed more clots of blood.

The red blood count was 4,200,000 with hæmoglobin 40 per cent. and white blood count 8,000-10,000. Her temperature varied from 102°-104°, and her pulse was 130. The Widal and Wasserman reactions were negative. The urine showed the presence of red blood cells and acetone. The stools were negative for tubercle bacilli, and as indicated above, amœbæ were found.

Autopsy.—Only a partial autopsy was permitted and was performed three hours after death. The body presented a marked degree of emaciation and the muscles were flabby. The mucous membranes were very pale. The subcutaneous fat in the anterior abdominal wall was scanty in amount and the recti muscles were poorly developed. The small intestines were moderately distended with gas and there was no excess of fluid in the abdominal cavity. The cæcum was much dilated and was lying partly in the pelvis where it was bound to the posterior surface of the bladder, and to the uterus by filmy adhesions which were easily broken, and to the lateral abdominal wall by firmer adhesions. The tissues of the cæcum were softened to such an extent that on attempting to break the adhesions, the bowel was perforated in several places. With the exception of the large bowel the abdominal viscera presented nothing of special interest. The cæcum was very much dilated being almost double its usual diameter, and its wall presented numerous perforations which had been made in separating it from the lateral abdominal wall. The serosa was dull in areas and its blood vessels were engorged. On opening the large bowel a considerable amount of blood-stained mucoid material was found. Throughout its entire length the large bowel was involved in an extensive ulcerative process. The transverse and descending colon presented a narrow lumen and in these regions the bowel wall was thickened. Throughout the whole of the bowel from cæcum to rectum there was an intense engorgement of the blood vessels. There was very extensive ulceration of a peculiar type which involved roughly one-half of the entire mucosa. As a result of this process small islands of relatively normal mucous membrane remained, while between these the mucosa had entirely disappeared. These ulcers were very irregular in outline and in many instances had coalesced so that they ran both transversely and longitudinally in the gut. The edges of the ulcers were rounded, raised and tumefied and in places were necrotic. In nearly all instances, they were definitely undermined and it was possible to pass a probe from one area of ulceration beneath apparently healthy mucous membrane to adjacent ulcerated areas. The bases of the ulcers were smooth and depressed below the intervening œdematous mucosa and appeared to lie directly upon the muscle coat. The bases of some of the ulcers were covered by a yellowish gelatinous

XUM

material, but the majority of them were quite clean. The areas of ulceration were most extensive in the region of the cæcum and ascending colon.

Histologically the sections of large bowel presented extensive ulceration of a peculiar type. The mucous membrane remained intact up to the edge of the ulcer where it ended abruptly and was undermined. The base of the ulcer was formed by the inner or circular muscle coat which in some ulcers was clean, in others it was covered by a layer of necrotic tissue and the remnants of degenerating nuclei. The base of other ulcers presented a lymphocytic infiltration. The margins of the ulcers beneath the overhanging mucous membrane were densely infiltrated with lymphocytes and some endothelial and plasma cells. In other areas there was necrosis of the submucosa with degeneration of the overlying epithelial cells. In some instances this necrosis had gone on to such a degree that the normal structure was obliterated and the base consisted of a granular pink staining debris and chromatin droplets. The wall of one of these necrotic areas was found to be studded with amœbæ some of which contained red blood cells, and it was possible to demonstrate their presence well in advance of the process of necrosis while in some instances they lay within lymph channels. In the earlier lesions there was necrosis of the submucosa with lymphocytic infiltration and the presence of amœbæ. In one or two areas the amœbæ were found in the mucosa, beneath the epithelial cells and superficial to the muscularis mucosa. The mucous membrane was relatively slightly involved in an inflammatory process, and the ulceration had taken place directly above the areas of necrosis in the submucosa. The primary character of the lesion was necrosis with a superadded cellular infiltration consisting of lymphocytes, endothelial cells and plasma cells, with an insignificant number of polymorphonuclear leucocytes.

The type of lesion in the wall of the bowel, the demonstration of the amœbæ which in some instances had ingested red blood cells together with the clinical history and course of the disease all combine to present the picture of acute amœbic dysentery.

In a personal communication Dr. H. K. Detweiler related the history of an elderly man who had not been out of Canada or the northern part of the United States and who had a persistent mucous colitis, in whose stools he had been able to demonstrate repeatedly the presence of active amœbæ containing red blood cells. He suggested that this man represented the contact carrier type. Furthermore Prof. W. L. Holman related the case of an individual who had had an undiagnosed mucous colitis which had originated in Newfoundland or the Yukon. This colitis which had persisted for some years was finally diagnosed as amœbic dysentery in California and responded to appropriate treatment.

It is the opinion of the author that such cases are not as rare as usually claimed, and that with careful examination of the stools of persons suffering from mucous colitis the amœbæ would be encountered in as high a proportion of cases as in England or the United States where more work has been done in this regard.

I wish to record by appreciation of the helpful co-operation of Prof. O. Klotz at whose suggestion this case has been reported, and also my indebtedness to Prof. D. Graham through whose courtesy the clinical records were made available.

NOTE.—Since the completion of this paper my attention has been attracted to an article by Mayers and Hirsch (*Amer. Jour. Med. Sci.*, 1925, clxx, 43) in which they report six cases of acute amœbic dysentery which have occurred in Chicago within the last six months. Of this number two appear to have been contracted in the Northern States. Four of the cases were recognized clinically and responded to appropriate treatment, but the remaining two remained undiagnosed until their true nature was revealed at the autopsy table. These authors believe that the possibility of amœbic infection in patients with a chronic ulcerative colitis should be considered, and that a search for amœbæ should be conducted before a diagnosis of idiopathic ulcerative colitis is made.

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SOME STUDIES ON THE INCIDENCE OF GOITRE AMONG SCHOOL CHILDREN IN MANITOBA

T. GLEN HAMILTON, M.D., F.A.C.S.

Lecturer in Clinical Surgery, Faculty of Medicine, University of Manitoba

Assistant Surgeon, Winnipeg General Hospital

AND

D. F. MCRAE, M.D., C.M.

THE following studies* are based on the findings in a survey of 2,329 children in the city of Winnipeg and several country points in Manitoba. The area covered in this survey was not as extensive as might be desired, yet through careful choice of the districts the findings can be taken as representing fairly the actual situation throughout the province.

To the casual observer there is at once apparent a marked variation in the incidence of goitrous enlargement in different sections of the city. Our citizens, in a general way, have grouped themselves for residential and other reasons into what may be termed "racial districts" and variations in the incidence of goitrous enlargement have been found to correspond closely to these districts. The advisability and value of an analysis along racial lines is therefore apparent. This along with considerations of age and sex comprise the studies detailed herewith. These are presented in a series of charts with explanatory text.

Estimation of the degree of thyroid enlargement was made as uniformly as possible. "Slight" was applied to those barely perceptible to sight and touch; "moderate" included all those which would be detected by the average person on the street without appearing very disfiguring; "marked" cases were those in which the individual lobes of the gland were distinctly outlined or where a deforming mass was present in the neck.

This chart shows a percentage analysis of the goitre survey covering 1,609 pupils in twelve schools in different districts between the ages of five and eighteen. The groups of those examined were distributed fairly evenly over this whole age period, and in this chart the comparative readings of the incidence for the several districts is interesting. Reading from left to right along each column the normal, slight, moderate and marked proportions and percentages are indicated. Reading from right to left the height of the darkened column indicates the total goitrous incidence as expressed also in percentage figures. A further analysis of the first four districts noted is made in a separate chart, (No. 6). The subsequent eight will also be more fully dealt with in other charts.

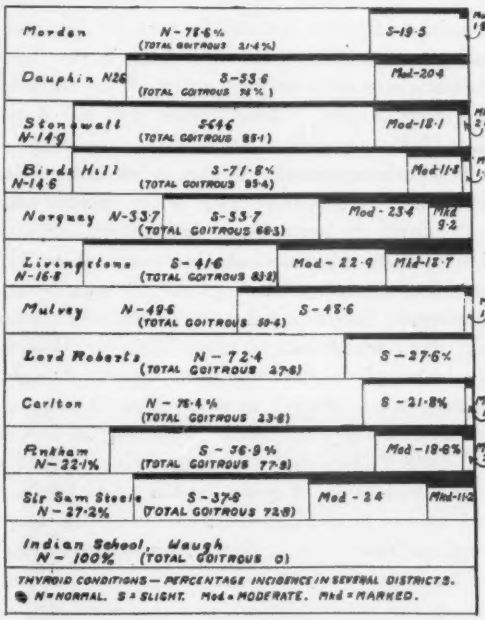

CHART 1.

*The study of which this and the following paper, by Prof. A. T. Cameron, present the conclusions, was based upon investigations by a committee of the Winnipeg Medical Society named in April, 1924, "To study the incidence of goitre in Winnipeg and the province of Manitoba." This committee made its final report to the Winnipeg Medical Society, May 22, 1925.

It is to be noted that the Norquay School possesses a broad spread of cases in the four groups. This is also more marked in the Livingstone, and in these schools the Jewish and Slavic races are present in a large percentage. Take on the other hand the Mulvey, Lord Roberts and Carlton schools; here a large number of normal children are noted and also a varying number of slight cases with very few moderates and no marked cases. In these schools the dominating racial groups are English, Scotch, and Irish. Take next the Pinkham where again a large number of slight cases and also quite a number of moderate and a few marked cases occur; here we have not only English, Scotch and Irish but a considerable proportion of Germans, Slavs and Jews. This would appear to account for the conditions shown. In the Sir Sam Steele school with its marked spread of cases in all four classes there is a large proportion of German and Slav pupils. These details will be shown more definitely below.

The Indian school at Waugh a few miles from the intake of the Winnipeg Water Works conduit supply is particularly interesting. Sixty-eight pupils examined at this point show 100 per cent normal. These pupils, it will be remembered, have no water to drink other than that from which our Greater Winnipeg Water Works supply is obtained, and therefore might be expected to show a large number of goitrous children, if the only factor producing such was the absence from that water of iodine. The remarkable absence of goitre among these Indians will have to be accounted for in some other way. Comment upon this freedom from goitre among the Indians was made to a medical practitioner who is widely acquainted with the condition of health among Indians in this province. He has visited an aggregate of about three thousand and cannot recall having seen a case of goitre among these people. The recent Alberta survey[1] report, however, does not give so good a showing for the Indians. An incidence of about 9.4 per cent. is there indicated. Keith[2] found no goitre amongst the Indians in the Pemberton Valley, B.C., though incoming whites rapidly developed it.

A careful classification was made according to the racial origin or grouping of the 1,609 pupils, with the following results:—English 187; German 109; Indian 68; Irish 37; Jewish 130; Polish 23; Ruthenian 37; Scotch 100; Canadian 902; various others 93; total 1,609.

These various groups were then classified according to the thyroid condition in each group, and the following plates indicate those findings diagrammatically.

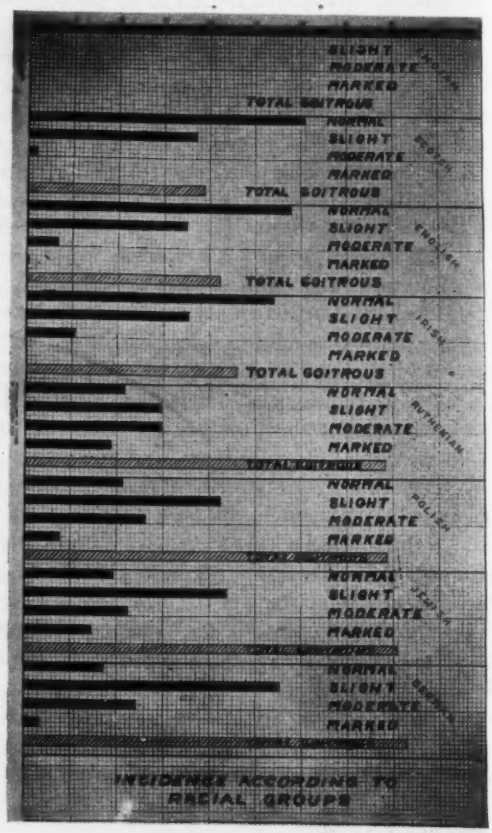

CHART 2.

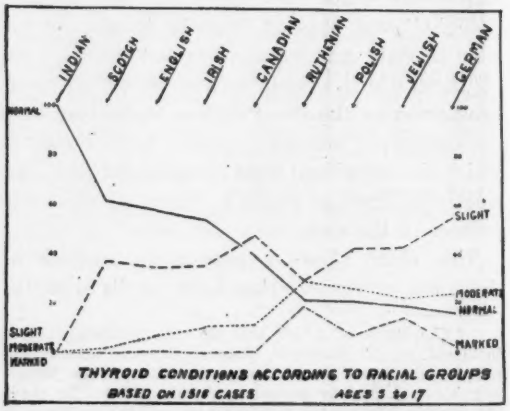

CHART 3.

The racial groups are taken in the order of their highest normal showing. The Scotch, English and Irish, present in order conditions nearest to the non-goitrous Indian, with a high percentage in both normals and slight goitre classes. This is the case because few have passed from the slight to appear in the moderate or marked classes; whereas in these groups the ratio of slight to total goitrous cases is relatively large, in the Ruthenian, Polish and Jewish groups, the opposite is true. This seems to be due to *a greater resistance to the development of marked goitre in the first three groups.* The German group, while showing the fewest normals, shows also the highest percentage of slight cases, and like the Scotch, English and Irish, exhibits that characteristic which appears to stay advance from this to the moderate and marked degree.

An analysis of 902 children classified as Canadian but whose origin was not definitely determined shows 39.6 per cent. normal, 47.8 per cent. slight, 11.8 per cent. moderate and 0.8 per cent. marked. This distribution occupies that intermediate position which is to be expected from this mixed group.

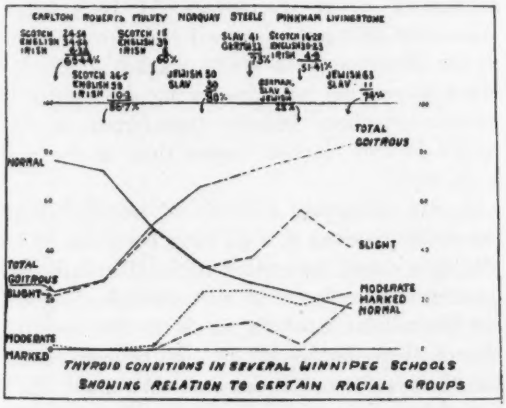

CHART 4.

A further analysis of the racial feature is made here. The seven schools are classified and the predominating races are shown for each. The Scotch, English and Irish predominating in the Carlton, Lord Roberts and Mulvey schools, account for the high percentage of normals in them. In the Norquay 80 per cent. Jewish and Slav races are present and a sudden drop in the normals is here apparent with a continued decline in the subsequent schools. In the Pinkham, however, with more than 50 per cent. Scotch, English and Irish, there is a definite rise in the number of slight cases compared with moderate and marked, due to these. In the Livingstone school, the Jewish and Slav tendency toward goitre stands out strongly in the very reduced number of normals.

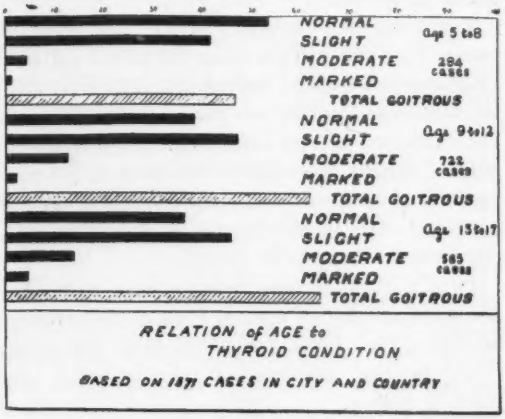

CHART 5.

This chart shows the incidence of goitre in its various degrees in the three age groups indicated based upon 1,571 pupils from both city and country. There is obviously a gradual decrease in the number of normals from five to seventeen, with an increase in "slights" followed by a slight decline later, and a progressive increase in the number of moderate and marked

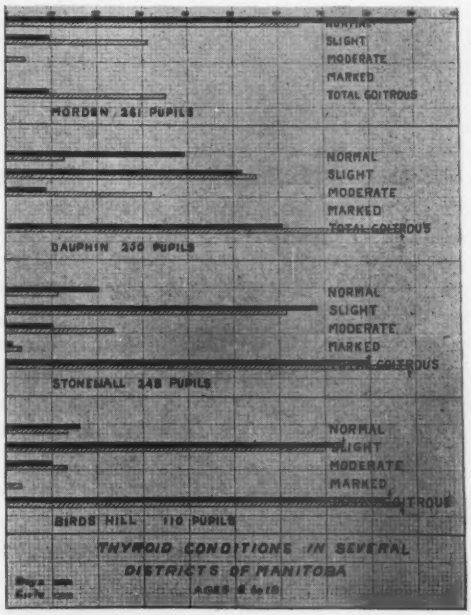
MORDEN 361 PUPILS
DAUPHIN 330 PUPILS
STONEWALL 348 PUPILS
BIRDS HILL 110 PUPILS
THYROID CONDITIONS IN SEVERAL DISTRICTS OF MANITOBA
AGES 5 to 18

CHART 6.

cases. The manner in which moderate and marked cases are recruited from slight cases is well shown here. The total goitrous percentage is interesting as indicating that puberty can only be considered a secondary factor in this series of cases.

Indicated here is the relative incidence between boys and girls as reported in the districts of Morden, Dauphin, Stonewall and Birds Hill. As the cases in the two former districts were not examined by the authors the percentage incidence cannot be stressed, but the relative proportion of goitrous enlargement found among boys and girls in each corresponds closely with our own findings.

It is worthy of note that in these rural districts the number of normal boys exceeds that of normal girls. *Girls appear to show less resistance to the development of moderate and marked goitres.*

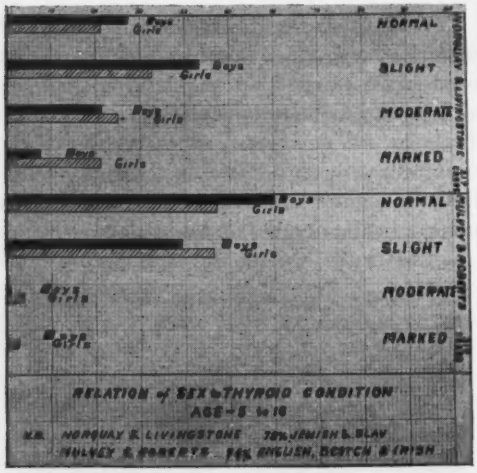

CHART 7.

This shows a similar sex analysis for two districts of Winnipeg in which the national groups are different. The relatively greater percentage of boys in the slight column again seems to point to a lesser resistance of girls to the development of goitre. *The effect of race is very marked when comparison is made between the two groups.*

This chart indicates the incidence of thyroid enlargement for each sex for each two-year period from six to eighteen. Approximately 59 per cent. of boys and 57 per cent. of girls have normal thyroids when starting school. This normal percentage decreases steadily until puberty has been passed after which it again rises. The decrease of normals for girls in each successive period is much more marked than for boys.

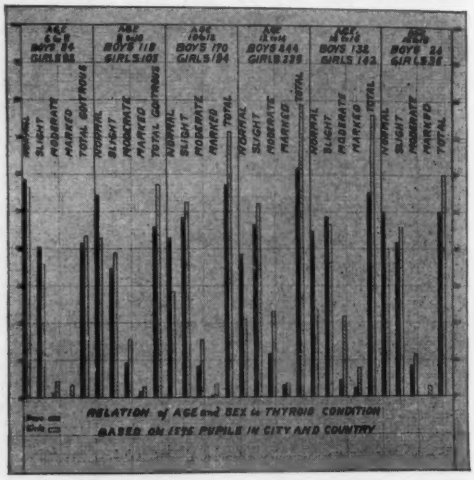

CHART 8.

With increasing age up to adolescence there is increasing goitre percentage in both sexes. Again indicating the lessened resistance of girls to the development of more marked goitre the chart shows that with increasing age relatively greater numbers become transferred to the moderate and marked classes than is the case with boys.

As the foregoing analysis of children indicated the presence of a goitrous condition to an alarming extent in certain national groups, the question naturally arose as to whether certain conditions of life which obtain in this country among these people might not be responsible for their goitrous tendencies. We were glad, therefore, of an opportunity to check up the findings by a further survey covering a number of Jewish, Ukrainian and Polish immigrants who were recent arrivals. Through the courtesy of the chief medical inspector of the Winnipeg schools, we accordingly made a survey of forty-five pupils all of whom had arrived subsequent to June 1st, 1924, and 40 per cent. of whom had arrived subsequent to January 1st, 1925. From this group for comparative purposes we eliminated all above the age of twenty. Of the thirty-four pupils from seven to twenty years of age there were only three cases of goitrous enlarge-

ment—all slight. Of these two were Jewish, aged fourteen and fifteen, who arrived in August and September, 1924, respectively; the third was Ukrainian, fourteen years of age who arrived in June, 1924. The districts from which these people emigrated were various. Many came from Kief and other parts of Russia, and a large number from Poland and Roumania. The absence of goitre aomng these people undoubtedly indicates that there is some anti-goitre factor present in the country from which they emigrated but not present in this country. The most likely factors are, first, the nature of their food; second, hygienic conditions under which they are living. The question of hygienic conditions, especially in the matter of cleanliness, would seem to be important since we have noticed that quite a number of those more severely affected are living in ill-ventilated and unsanitary conditions.

Conclusions

1.—There is a high incidence of goitre among school children of Manitoba.

2.—There is no marked difference between the sexes in the earlier school ages. *With increasing age goitre predominates in girls;* after puberty there is an apparent general reversion toward normal which is not so marked amongst girls.

3.—*There is an apparent difference in the susceptibility of the various races.* This shows both in the total goitrous incidence and in the degree of severity.

4.—The findings indicate the possible importance of causative factors other than the water supply.

5.—The situation is such as to demand active preventive measures.

Recommendation

Regarding treatment we are convinced that in the light of present knowledge the general use of iodized salt is the best preventive measure. The indiscriminate use of other iodine preparations is, however, to be condemned except under proper medical supervision, since in certain types of goitre cases there is good reason to believe that these preparations are distinctly harmful.

References

(1) Alberta Tuberculosis Survey, 1924. (2) *Can. Med. Assn. Journ.*, 1924, xiv, 284.

Food Preservatives.—It having come to the notice of the Public Health Committee of the British Medical Association that certain proprietors were endeavouring to bring pressure to bear on the government departments concerned, the committee drafted a recommendation, which was endorsed by the council. This recommendation was approved by the representative body, and will be sent to the government department in question. It runs as follows: (*a*) The representative body is satisfied from the experiments made from the recorded cases, and also from the fact that other countries have discontinued their use, that it is essential in the interests of public health that boric acid and borons should not be used as food preservatives. (*b*) While recognizing that there are difficulties inherent in this country, due to the lack of cold storage facilities and efficient means of transport, which do not exist to the same extent in America and other foreign countries, the representative body is of opinion that, as a matter of principle, it would have been better if the example of other countries in prohibiting entirely the use of preservatives and metallic and other toxic colouring matters in foods could have been followed in the draft regulations re food preservatives, etc., issued by the ministry of health. (*c*) The members of the representative body draw particular attention to the evils that have arisen in their own experience from the importation of liquid eggs preserved with boric acid, and the representative body considers that it is essential from the public health point of view that liquid eggs preserved with boric acid or other preservative should be prohibited at once. (*d*) Subject to the foregoing recommendations, the representative body places on record its approval of the draft regulations (issued by the ministry of health, February 17, 1925) with regard to preservatives, etc., in food. Correspondence. *J.A.M.A.*

BASAL METABOLIC DETERMINATIONS IN 250 WINNIPEG SCHOOL CHILDREN

A. T. CAMERON, D.Sc., F.I.C., F.R.S.C.

Professor of Biochemistry, Faculty of Medicine, University of Manitoba

Winnipeg

THE results in tests with children at the Winnipeg General Hospital during the past three years have gradually confirmed me in an impression that the figures taken as normal and based on Benedict and Talbot's results for body-weight[1] are too low for children in this climate.

The goitre survey of the Winnipeg school children made in the summer of 1924 by Dr. Fahrni and Dr. Glen Hamilton, in connection with the Winnipeg Health Survey and the extended survey carried out subsequently by Dr. Glen Hamilton and Dr. McRae, suggested the desirability of making a series of metabolism tests on a reasonably large number of children, which should include as large a proportion as possible of normals.

Through the co-operation of Dr. Hamilton and Dr. McRae, who have selected the cases, and of the Winnipeg School Board and Dr. Mary Crawford, who made the necessary arrangements and provided a trained nurse to assist me in carrying out the actual measurements, and through the assistance of the Provincial Board of Health of Manitoba in providing the apparatus, and the Winnipeg Medical Society in defraying the cost of the necessary chemicals, it has been possible to carry out this series of tests during January to April inclusive of this year.

In all 250 children were tested, including eighty-six classed as normals. Tests were completed with 248 of these, and these may be classified as in Table 1.

These children were taken from twelve schools. The distribution between goitrous and normal cases from each school was uneven, due to the uneven distribution of goitre in the city, referred to in Dr. Hamilton and Dr. McRae's report.

A Sanborn Handy Apparatus was used throughout the tests. This was employed since it is hoped to extend the survey to rural Manitoba, in which case a portable instrument will be necessary. The reliability of this instrument will be discussed below.

TABLE I

CLASSIFICATION OF CHILDREN EXAMINED

Age years	Males				Females			
	Normal	*Slight Goitre*	*Moderate Goitre*	*Marked Goitre*	*Normal*	*Slight Goitre*	*Moderate Goitre*	*Marked Goitre*
6–9.....	4	2	1	1	2	4	4	1
9–12.....	12	9	7	1	15	11	23	13
12–15.....	16	13	12	8	28	15	16	13
15–17.....	3	3	1	0	4	0	3	3
Total....	35	27	21	10	49	30	46	30

The whole of the tests were carried out by a nurse, Miss T. Hermann, under my supervision, and I wish to take the opportunity to express my appreciation of her conscientious work and intelligent co-operation. The personal equation has therefore been eliminated as regards comparison between normal and goitrous children in this series.

Each child was given a preliminary test, usually on the preceding afternoon, and came to the laboratory early next morning without breakfast, resting prone for half an hour before the test commenced, the usual precautions for a clinical test being observed. Usually three children were tested each morning. One test only

was made, since time and facilities did not permit routine repetition.

A fifteen-minute test was made. A series of three readings was taken at the commencement of each minute interval, and the mean of the three referred to that time. (I have used this plan for three years at the Winnipeg General Hospital, and find that it affords complete supervision of a test carried out by a technician, provided notes are made during the test as to any degree of restlessness, or other disturbing influence). Two minute averages were made of the results from each test, and enabled any discrepant readings, due either initially to adjustment of mouthpiece or other irritation, or in the last two or three minutes to increasing discomfort (indicated by increased oxygen consumption) or drowsiness (indicated frequently by decreasing oxygen consumption), to be excluded.

The child's temperature was taken before and after the test. In a small proportion of cases there was a distinct supernormal temperature, and in these a correction was made at the rate of 7.2 per cent. per degree Fahrenheit[2]. In a somewhat larger number of cases the temperature was subnormal throughout. This will be referred to later.

The instrument used is stated to be calibrated for a temperature of 21°C, and to be corrected for 3 per cent. of water vapour unabsorbed during the test. I am uncertain as to the accuracy of the latter correction. I have calibrated the instrument against a standard air-meter at known temperature, and the scale was found to be 2 per cent. too high. The Sanborn Benedict apparatus in use in the Winnipeg General Hospital at present, tested in the same way, was found to be accurately calibrated (excluding the water-vapour correction), and a comparison of the two instruments with normal individuals. made over three consecutive ten minute intervals, the first and third with one instrument, and the second with the other, showed also that the "Handy" apparatus was 2 per cent. too high. The necessary correction has been made in the results.

Girls who had not menstruated were regarded as pre-adolescent. It was more difficult to decide the state of adolescence of the older boys, but an attempt was made to classify them by change of voice.

Benedict[3] has recently recommended that for girls between one and twelve years of age basal metabolic results should be referred to height alone. The results in this series for normal girls below twelve years referred to height show a much greater spread than when referred to weight, and I have used weight only in analyzing the results for pre-adolescent children of both sexes.

Results obtained with normal children.—These are shown graphically in Fig. 1, oxygen consumption per minute corrected to O°C. being plotted against weight. It is obvious that the points obtained for pre-adolescent children do not at all fit the curves derived from Benedict and Talbot's predicted figures[1]. Empirical linear curves have been drawn, and the points

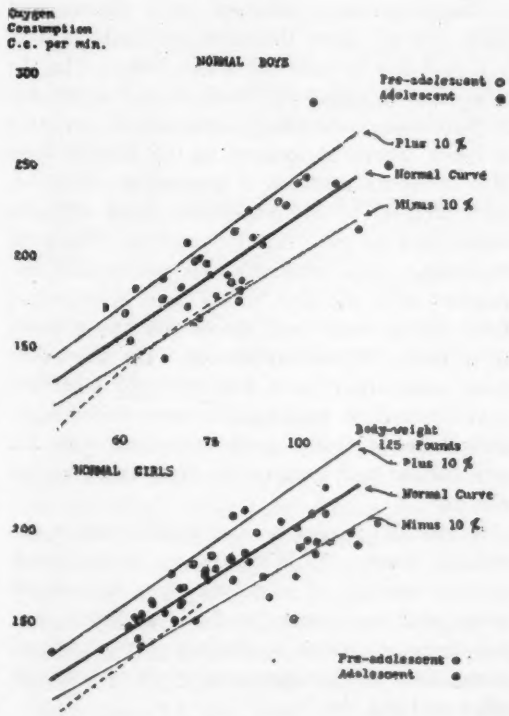

FIG. 1.—The dotted lines are curves derived from Benedict and Talbot's predicted values (1921).

group round these fairly satisfactorily, with few exceptions the results being within plus or minus 10 per cent. of the normals derived from these lines. One girl was markedly low, and may be abnormal.

The values taken as normal from these empirical curves are shown in Table II, and it is in-

teresting to note that those for females are 7 per cent. lower than for males of the same weight, in agreement with the normal difference between adults of the two sexes. Benedict and Talbot's curves for children show a smaller difference.

TABLE II

PREDICTED VALUES FROM RESULTS WITH NORMAL CHILDREN

Weight	*Oxygen consumption per minute*	
Pounds	Boys	Girls
30	128	117
40	141	130
50	155	143
60	169	156
70	182	169
80	196	182
90	210	195
100	223	208
110	237	221

The discrepancy between these figures and those derived from Benedict and Talbot's data can probably be referred to two factors. In the first place measurements with clinical apparatus of this type undoubtedly are carried out with a lesser degree of comfort to the subject than measurements made in a metabolism chamber, and further, in my experience with subjects tested both on the "Handy" and the "Sanborn Benedict," they invariably reported greater discomfort with the first. This is to be expected from the greater dead space, and the absence of a motor driven circulation. On the other hand consecutive tests with the two machines gave concordant results on the same individuals, and Benedict found good agreement with his own clinical instrument and metabolism chamber results.[4]

A probably larger source of difference is the climatic factor. In Winnipeg we have a much greater amount of sunshine than in eastern cities such as Boston, and it is known that heliotherapy causes a distinct rise in basal metabolism (cf. the summary by du Bois of the effect of light, etc.[5])

Since so many clinical measurements of basal metabolism are made by determining oxygen consumption with closed circuit apparatus, it would seem desirable, at any rate as far as children are concerned, to establish normals for the type of instrument used at any centre where many determinations are made.

I feel justified in using the figures given in Table II in future work here in which the clinical type of apparatus is used, and consider that they can certainly be justifiably employed in testing the goitre cases measured in this series.

It is possible that the linear curve that has been found can be applied to over-weight children who are definitely pre-adolescent. Thus a girl of twelve years and seven months, who had not menstruated, weighed 159 pounds, and was 64.5 inches high, was very fat, but with the fat well distributed, and appeared to be perfectly normal except for a slight goitre. Her oxygen consumption was 289 cc. per minute. Referred to the extended linear curve, the basal metabolic rate was plus 2 per cent. Since such curves certainly do not rise above the linear with increasing weight, and since in this girl there was no evidence of childhood myxœdema or cretinism, nor of hyperthyroidism, such a figure is of the expected order.

Analysis of the few figures from the adolescent normals is more difficult. Referred to the linear curves for pre-adolescents, they tend to show a slight relative decrease with increasing weight, in agreement with previous observations. Referred to surface area, using the du Bois formula and Boothby and Sandiford's chart[6] they seem to show a somewhat low figure for girls, averaging minus 7.7 per cent. of the predicted value for nine girls between thirteen and sixteen; the figures for boys were within normal limits. The number examined are too few to draw any definite conclusions, but in considering the results with goitrous girls, a somewhat lower figure was accepted as within normal limits.

Results obtained with goitrous children.—The figures with pre-adolescent cases are shown in Table III.

These figures show that of 141 children 128 (91 per cent.) were within the extreme normal limits of plus or minus 15 per cent., and 101 (72 per cent.) were within the limits of plus or minus 10 per cent.

Three adolescent goitrous boys were considered to be within normal limits. Of twenty adolescent goitrous girls one was considered definitely high, one doubtfully high, and one doubtfully low.

A number of measurements were repeated subsequently with the machine in the Winnipeg General Hospital. These comparisons, and all the definitely abnormal results, are considered in more detail in Table IV.

Requests that several others of these abnormal

TABLE III

Basal Metabolic Rate

Age years	*Boys Within* +or− 10%	*Between* +10 and +15%	*Over* +15%	*Between* −10 and −15%	*Under* −15%	*Girls Within* +or− 10%	*Between* +10 and +15%	*Over* +15%	*Between* −10 and −15%	*Under* −15%
6–9.....	2	1	0	1	0	6	3	0	0	0
9–12.....	12	1	3	1	0	33	7	4	1	0
12–15.....	26	3	1	2	0	20	6	5	1	0
15–17.....	2	0	0	0	0	0	0	0	0	0
Total.....	42	5	4	4	0	59	16	9	2	0
Per cent....	77	9	7	7	0	70	19	9	2	0

TABLE IV

Case	*Sex*	*Clinical Finding*	*Age*	*Weight lbs.*	*Oxygen Consumption c.c. per minute Found*	*Normal*	*B.M.R. %*	*Remarks*
J. H....	M	Normal	11	86	225	204	+10	Repeat at W.G.H., 8 weeks later: +12%
J. C....	M	Slight Goitre	11	66½	220	177	+24	Repeat, W.G.H., 7 weeks later: +11%.
J. E....	M	Moderate Goitre	9	51	186	156	+19	.....
L. S....	M	Slight Goitre	13½	111	328	237	+34	Tested, W.G.H., 8 weeks previously: −13%.
M. W...	M	" "	11	79½	246	195	+26	Repeat, W.G.H., 12 weeks later: −8%.
E. K....	M	" "	14	96	196	217	−10	Repeat, W.G.H., 7 weeks later: +12%.
F. M....	M	Moderate Goitre	13	72	208	185	+12	Repeat, W.G.H., 8 weeks later: +11%.
B. M...	F	Normal	13½	68½	155	205	−24	.....
H. M...	F	Slight Goitre	13¾	78½	(216)	180	+20	Test not very satisfactory.
E. B....	F	Moderate Goitre	9	43½	168	134	+25	Test not very satisfactory.
E. G....	F	" "	11½	70½	207	169	+22	Repeat, W.G.H., 7 weeks later: +33%.
F. G....	F	Marked "	11	68½	197	166	+19	.....
E. H....	F	Slight Goitre	12½	71	206	170	+21	.....
T. K....	F	Moderate Goitre	13	75½	210	176	+19	.....
M. L....	F	Slight Goitre	10½	74	204	173	+18	Repeat, W.G.H., 8 weeks later: +1%.
M. R...	F	Moderate Goitre	12	78½	225	180	+25	.....
I. S.....	F	Slight Goitre	12	74	225	173	+30	.....
L. D....	F	Moderate Goitre	14	93	264	(218)	(+21)	Adolescent. Ht. 64½".
A. W...	F	Marked Goitre	14	108	198	(228)	(−13)	Repeat, W.G.H., 9 weeks later: −11%

cases be re-examined have not yet been complied with by the parents. The re-examinations that have been made suggest that probably not more than one-third will prove to be abnormally high, so that the fairly reassuring conclusion may be drawn that of the 162 goitrous children measured not more than 4 per cent., and probably not more than 2.5 per cent. are definitely above normal limits (and therefore probably hyperthyroid), and none are definitely below normal limits.

A distinct percentage of the children examined showed a subnormal temperature during the test. Corresponding to this, their basal metabolism seems to be slightly higher. Thus the average rate for twenty-three pre-adolescent girls whose temperature did not vary beyond the limits of 98.4° and 98.6°F. during the test was +3.7 per cent., while that of ten pre-adolescent girls whose temperature was constant at 98.0°F. throughout the test was + 7.8 per cent. However, the corresponding figures for normal pre-adolescent girls, twelve with normal and three with sub-normal temperatures, were + 2 and + 1 per cent., so that no attempt has been made to draw any conclusion with this limited number of subjects.

Summary

Linear curves, which are definitely higher than those based on Benedict and Talbot's predicted figures, have been determined for basal oxygen consumption by normal, pre-adolescent children, measured in Winnipeg by a closed circuit clinical apparatus.

Of 163 goitrous children, whose oxygen consumption has been measured under basal conditions, and referred to these curves, probably not more than 2.5 per cent. are definitely above maximum normal limits (and therefore possibly hyperthyroid), and none are definitely below normal limits.

References

(1) Benedict and Talbot, "Metabolism and Growth from Birth to Puberty," *Carnegie Inst. Publ.*, No. 302, 1921, page 206. (2) du Bois, "Basal Metabolism in Health and Disease," Phila. and New York, 1924, page 330. (3) Benedict. *Proc. Am. Phil. Soc.*, 1924, lxiii, 25; through *Chem. Abst.*, 18, 3640. (4) Benedict and Collins, *Boston Med. Surg. J.*, 1920, clxxxiii, 449. (5) du Bois, *loc. cit.*, page 132. (6) du Bois, *loc cit.*, page 143.

THE GOITRE PROBLEM

FRANK H. LAHEY, M.D., F.A.C.S.

Boston, Mass.

IN considering the subject of goitre it will be my endeavour to present it in its most simple and brief clinical form, in order that the subject may be covered in the allotted time, and that the basic groups with their clinical features and methods of treatment may be readily grasped.

We have in our clinic classified thyroid* disease as follows:

ADOLESCENT GOITRE,
Colloid goitre,
Hyperplasia,
Multiple colloid adenomata.

ADENOMATOUS GOITRE,
Discrete—toxic,
Multiple—non-toxic.

CYSTS,
With and without adenomatous remnant.

PRIMARY HYPERTHYROIDISM or exophthalmic goitre,
(a) Thyrocardiacs.

THYROIDITIS,
With and without abscess.

CARCINOMA.

SARCOMA.

Adolescent goitre is the enlargement of the thyroid occurring in young girls, usually at or about the establishment of the menstrual period, usually without toxic symptoms. The character of thyroid enlargement varies with the geographical location, with the length of time the goitre has existed and the consequent degree of thyroid degeneration. In our community, close to the seaboard, nearly all of our adolescent goitres are hyperplastic in character but without toxic symptoms. They show very moderate and symmetrical swelling of the entire gland and as a rule disappear before the individual reaches thirty years of age. They have practically never produced symptoms of any character and have not required treatment.

In regions, however, where goitre is endemic and where the iodine content of the water supply is low, adolescent goitre is a much more serious problem. The early goitre is colloid in character and degenerates into the colloid adenomatous type, as it continues to exist over longer periods of time. It appears at first as a more or less symmetrical enlargement without definite nodules, moderate in size and without toxic symptoms. As degeneration goes on, small globe-like masses appear and can be palpated as nodules of varying size throughout the gland. This is the stage of multiple colloid adenomatous goitre.

Treatment of adolescent goitre occurring in a goitrous region, to employ a Hibernianism, should consist in the prophylactic administration of iodine before even the colloid enlargement appears and most certainly before the multiple colloid adenomatous stage of degeneration occurs.

Iodine may be of distinct value during the colloid stage, causing lessening or disappearance of the goitre. It is, however, not of value at the stage when the gland has become colloid adenomatous in character, and, in fact, is dangerous at this stage because of the fact that the use of iodine in any adenomatous goitre may and frequently does convert such a non-active goitre into an active and toxic one. It is evident, therefore, that the promiscuous use of iodine without first carefully discriminating as to the type of goitre is distinctly dangerous and to be discouraged.

Adenomatous goitre consists of two types: the multiple colloid type mentioned above, which is an end stage of degeneration or alteration in the gross character of the gland from normal or hyperplastic gland to the colloid gland, on to the multiple colloid adenomatous gland with the spherical masses of thyroid tissue described above. Because these masses are discrete and because it is easily possible to shell them out of the gland, they have been termed adenomatous, although they possess no true capsule and are to be distinguished from the true discrete adenomata by this fact. We have never seen these non-encapsulated multiple adenoma exist in the absence of colloid degeneration.

We have treated the above described group with iodine in the early colloid stage and with

*Exclusive of myxœdema, tuberculosis and syphilis.

surgery in the later adenomatous stages, when the goitre was unsightly, causing pressure, intrathoracic in location, or toxic.

True discrete adenomata have occurred in our experience most often singly, although we have occasionally seen two or three existing in one gland. They attain any size up to a football, have a definite fibrous capsule, and while necrosis and degeneration up to the point of conversion into a cyst frequently occurs, they very frequently exist in our community with their encapsulated tissue, appearing as firm, apparently normal thyroid tissue. We have treated this type of goitre solely by surgery as we know of no other measure which will accomplish its entire removal. We have felt that the discrete adenomata should be removed for any of the following causes: when they are causing pressure, particularly upon the trachea, and we have been surprised at times to observe the degree of tracheal denting which can occur with a small adenoma situated on or close to the isthmus of the gland; when they are unsightly; when they are producing symptoms of toxicity; when they are completely or incompletely intrathoracic in location. We have also advised the removal of discrete adenomata of the thyroid in all persons past forty because of the danger of malignant degeneration.

The intrathoracic location of a discrete adenoma or cyst or of a multiple colloid adenomatous goitre is an extremely undesirable goitre complication, producing, as it often does, deviation and narrowing of the trachea with respiratory difficulties up to the point of complete suffocation. It is also undesirable in that these intrathoracic masses cannot be removed without opening the superior mediastinum and exposing the individual to the danger of mediastinitis,—a condition which has occurred only twice in over two hundred complete and incomplete intrathoracic goitres, but which has been fatal in spite of all measures in the two cases occurring in our experience. We have urged, therefore, that all intrathoracic goitres and all goitres tending to become intrathoracic be removed. They are to be diagnosed or suspected when the lower poles of the thyroid extend downward below the clavicles and cannot be palpated when the patient swallows; when the dome-like top of a completely intrathoracic adenoma can be felt projecting up behind the sternum or the clavicles; when marked lateral displacement of the trachea may be demonstrated by palpation of that structure; when intralaryngeal examination shows tracheal deviation or flattening; when upper chest dullness can be demonstrated, and when an intrathoracic mass with displacement and change in outline of the trachea can be demonstrated by x-ray as practically always can be done with intrathoracic goitre.

Practically all intrathoracic goitres are removable. We have had occasion to split or remove the manubrium of the sternum but twice for removal of superior mediastinal masses in an experience now with considerably over two hundred intrathoracic goitres.

The occurrence of malignancy in goitre in our clinic has been approximately 2 per cent. and practically all of the malignancy which we have seen has arisen in the discrete adenomata. It is for this reason that we have strongly urged the removal of these adenomata while they are still benign. We have repeatedly written and stated that there are no clinical features whereby the early onset of malignancy in these adenomata may be diagnosed, that the only favourable cases which we have had are those cases in which the malignancy was discovered still within the capsule of the adenoma following routine removal of these adenomata. It has been our experience that operation was for the most part hopeless in the cases where it was clinically possible for us to make the diagnosis of malignancy of the thyroid, since in these the malignancy has broken through the capsule and has so involved the surrounding structures that complete removal of all of the malignant tissue was not possible. It must be recalled that the size of the thyroid is such that any even very moderate sized adenoma will so completely involve the lobe that extension beyond the limits of the adenoma results in extension and involvement of these structures around and beyond the thyroid gland. It is unfortunately true, also, that by the time the diagnosis of malignancy can be made clinically, metastasis has occurred into the deep cervical lymph nodes, making recurrence almost certain.

Malignancy of the thyroid is to be suspected when the consistency of the thyroid changes to stony hardness, when fixation of the gland occurs, so that its lobes have so little motion that

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they give the impression of being solidly cemented into their beds. This particular feature also characterizes a type of thyroiditis, and in such a case there is usually some degree of tenderness not commonly present with malignancy. Loss of outline in a previously discrete adenoma or adenomatous goitre should make one suspicious of malignant degeneration and a change in voice in a patient who has had a benign adenoma of the thyroid for some time should make one very suspicious that malignancy has so penetrated the posterior capsule of the gland as to involve and interrupt the conductivity of the recurrent laryngeal nerve. It is rare in our experience to see a husky voice due to cord palsies associated with adenomatous goitre, and its appearance with such a previously existing condition of the thyroid is extremely suggestive.

We feel, then, that since most of the malignancy of the thyroid arises in adenomatous goitre, since malignancy may not be diagnosed until it has extended beyond the limits of the thyroid itself, since that structure does not permit of removal with a wide margin of safety, since recurrence is almost certain to occur if one waits for a clinical diagnosis before operating, that the proper management of this group of cases is the removal of all adenomata in persons approaching the cancer age. We have hitherto set this age at forty, but are now urging the removal of adenomata in persons of thirty or thereabouts, and even younger persons.

Cysts of the thyroid practically all arise from degenerated adenomata. The central portion of the adenoma becomes necrotic, and the process of degeneration continues until only the fibrous capsule of the adenoma remains, the adenomatous tissue having been converted into a liquid. These tumours require treatment for practically the same reasons as do the adenomata themselves, with the exception of the fact that, possessing no secretory elements, they do not have the power of producing toxicity as do the adenomata. Although malignancy in thyroid cysts is of rare occurrence, it must be recalled that complete degeneration of all the adenomatous elements of the tumour frequently does not occur. There remain large islands of active epithelial tissue unattached to the wall of the cysts which make potentially possible the occurrence of carcinoma in these portions.

Exophthalmic goitre, or *primary hyperthyroidism*, comprises nearly half of all the thyroid cases seen in our clinic, amounting in two reviews of our operative experience to 43 per cent. in one and 46 per cent. in another, and is, we believe, the most serious of all the diseases of the thyroid exclusive of malignancy. It is the simplest of diseases to diagnose when its characteristic clinical features are frankly present, and the most perplexing to be sure of at times, particularly in those borderline cases occurring in individuals of known neurotic tendency.

After having had the opportunity of observing several thousand cases coming to the clinic suspected of goitre, we have arrived at certain definite convictions concerning the diagnostic features of hyperthyroidism. We feel that exophthalmos, when present and associated with the other signs of toxic goitre such as tachycardia and tremor, is a dependable eye sign, and that under these conditions the diagnosis is simple and convincing. In the absence of exophthalmos, however, we feel that staring or fixation is the one most dependable eye sign. We have almost never seen toxicity of thyroid origin in the absence of some degree of eye fixation. Lagging lids, inability to converge upon a near point, and trembling lids have been eye signs of little diagnostic value to us, since these signs are often absent and other much more convincing signs are present by means of which the condition may be diagnosed.

In the beginning of our thyroid experience, we did not believe that exophahalmic goitre could exist in the absence of an enlarged thyroid. We now know, however, that it can exist not only without a goitre but when the thyroid gland is smaller than normal. We have repeatedly observed primary hyperthyroidism in individuals showing very small thyroids, and we are definitely certain that the size of the tumour in the adenomatous variety or the size of the gland in the exophthalmic variety is of no great importance as indicative of the degree of toxicity. We are convinced of the soundness of this observation by the fact that the preoperative basal metabolic rate has been just as high in those cases with small thyroids as in those with the cardinal and classical signs of the disease, and by the fact that following subtotal thyroidectomy the basal metabolism rate descends to normal and the individual is relieved of his symp-

toms just as convincingly and completely as in the cases with the frank and certain signs of the disease.

Tremor has rarely been absent in these toxic cases, although it has varied greatly in degree in patients with similar intensity of toxicity. Tachycardia has been roughly proportionate to the seriousness of the intoxication. We wish to caution against pulse rate observations, however, made upon borderline and even definitely toxic patients while in bed and after a period of rest in bed. Under these conditions low pulse rates may be observed, which are capable of soaring to surprising heights when the patient is up and about under average conditions.

Of the secondary signs of the disease, periods of unexplained loss of weight, so-called nervous breakdowns, definite periods of change in temperament and disposition, associated with auricular fibrillation and gastro-intestinal upsets of unknown origin, are suggestive of the presence of this disease. Many or practically all of the secondary and most of the major clinical signs of the disease may, however, be absent in the early, mild, and borderline cases.

In our opinion the one single measure of greatest aid in the diagnosis and management of thyroid toxicity is the basal metabolic rate. Uncorrelated with clinical findings, it is confusing and without value, but when such observations are properly weighed and valued, together with clinical observations and history deductions, there is no single measure which surpasses it in distinguishing the borderline cases of mild toxicity from those neuroses of non-thyroid origin; also in following and demonstrating a complete or incomplete failure to cure by means of any of the suggested methods of treatment. A basal metabolism estimation is an impartial, non-sentimental critic, and any method of treatment purporting to bring about a cure of hyperthyroidism must be able to show in the case assumed as cured, normal basal rates at the time when a cure is claimed, and, in addition to this, these rates must be demonstrated to persist as normal for at least a year after this method of treatment.

The medical treatment of hyperthyroidism consists only of rest in bed with the hope that one of the natural remissions of the disease will occur and be prolonged, as is occasionally the case, into a permanent remission. There is no drug to-day which will lower the basal metabolism rate to normal and keep it there, not even Lugol's solution. Lugol's solution will be discussed under the heading of iodine. It must be realized definitely that Lugol's solution is a method of treatment preparatory for operation. It is not a method of treatment which aims to, or actually does, cure thyroidism.

X-ray and radium in a certain number of cases will undoubtedly lower the basal metabolism rate to or close to normal. It requires, however, a period of three to six months to ascertain whether or not it will be of value, and it fails in such a high percentage of cases, and results in recurrence in such a still higher percentage of cases that it is not, in our opinion, comparable with surgery as a method of treatment.

Surgery offers, we believe, the quickest and the most certain method of relieving hypertension to the most complete degree. It demonstrates the type of tissue dealt with—colloid, adenomatous, or hyperplastic—and permits of the removal of whatever percentage of the entire gland is indicated by the type of tissue involved. It accomplishes a gradual diminution in toxicity, even if it is necessary to operate upon the very toxic cases in stages, and in the cases done in one stage almost eliminates the toxicity within a few days. To this no one who has operated on toxic goitres in any number can fail to subscribe. There is in surgery hardly a parallel case where a wildly excitable individual is so rapidly changed into a calm and peaceful one, where racing functions are so rapidly and completely slowed to normal. The mortality rate of the past no longer exists in any well organized clinic dealing with thyroids. We have now operated upon 2,800 thyroids, each year's mortality rate rarely running more than a fraction over one per cent, and many years under one per cent.

One of the very distinct benefits to the hyperthyroid patient has been iodine, now largely given in the form of Lugol's solution. It has definitely diminished the number of multiple stage operations in our clinic, and has undoubtedly saved the lives of several of our intensely toxic cases coming to the clinic with vomiting, diarrhœa, and delirium.

It should be stressed, however, that treatment with Lugol's solution is not a method of curing

hyperthyroidism, but only a method of preparation for operative treatment. We do not mean that remission in the disease, permanent or temporary, may not occur following the administration of Lugol's solution. Should it occur, it will, in our experience, represent the very occasional exception. These experiences with Lugol's are similar to those of other clinicians and it is important that physicians recognize this fact, since the promiscuous employment of Lugol's solution is unwise and at times dangerous.

The widespread use of iodine in goitre is evidenced by the fact that in our clinic we now rarely see a case that has not been on iodine feeding for some time before coming to us. This often results in much confusion, particularly in those borderline cases with associated neuroses in which it is so difficult to determine whether or not a part or the whole of the state is of thyroid or non-thyroid origin. In such cases, seen after the prolonged use of iodine, it may be necessary to discontinue the administration of iodine for a period to ascertain the effect upon clinical symptoms and the basal metabolism rate.

In the administration of iodine alone one must realize that the only histological picture which we have of the effect of iodine is its ability to convert the hyperplastic thyroid into the colloid type of thyroid tissue, and hence that the type of goitre to which it should be given for diminution in toxic symptoms is exophthalmic goitre or primary hyperthyroidism. It is, then, of the greatest importance that one be able to distinguish definitely as to the character of the affected gland, since the administration of iodine to the adenomatous goitre not infrequently stimulates that type of goitre to toxic activity.

The use of small doses of iodine as a preventative of endemic goitre, and the ability of iodine to diminish the size of a non-adenomatous colloid goitre require no discussion, we believe.

There is still another group of thyroid patients concerning which we have written considerably within the last two years. This is the group which we have called *thyro-cardiacs*, a group of patients coming to the clinic with cardiac decompensation in part or wholly the result of an underlying thyroidism. The underlying thyroid toxicity is often overlooked in such cases. Many of them do not have enlargement of the thyroid; and they are often *apathetic* rather than *over-activated*, as is the case with typical hyperthyroidism; the loss of weight which usually accompanies thyroid toxicity is often obscured by anasarca accompanying heart failure,—and altogether, the urgently impressive, and therefore, misleading portion of the clinical picture is the overshadowing cardiac decompensation which may lead the attention away from the underlying thyroidism. This group has interested us particularly because we have found that they endure subtotal thyroidectomy remarkably well, and when relieved of their thyroidism regain their cardiac compensation to such a degree that most of them have been able to resume their normal activities.

A goitre should be searched for in every cardiac patient, and if found, even though it is apparently only a coincidence, the possibility of toxicity should be most carefully considered. Astonishing improvement has followed removal of an apparently innocent adenoma in some of our cardiacs. More than half of our thyro-cardiacs have no demonstrable goitre.

The typical thyro-cardiac is often markedly pigmented; they usually appear years older than they actually are. Ninety per cent. of our cases have been women. Their age has averaged fifty-one years. Basal metabolism rate is elevated both by the thyroidism and the decompensation, and an elevated rate in this particular situation—thyroidism plus heart failure—does not serve to clinch a diagnosis. The diagnosis must be suspected and confirmed purely by direct clinical history and examination.

Subtotal thyroidectomy carried out now upon more than seventy of these patients has resulted in two operative deaths. *Complete relief of complete disability has been the rule.* For example, a group of thirty-nine of these cases—all that we had operated on up to December 31, 1923—were reported by Dr. Hamilton* in August, 1924. One had died from operation; two could not be traced; four recovered and resumed activity but died later from various causes. The remaining thirty-two patients were able to maintain their normal activity; they averaged twenty months since operation; and

*"Heart Failure of the Congestive Type Caused by Hyperthyroidism," *Jour. Am. Med. Ass.*, Vol. 83, pp. 405-409, Aug. 9, 1924.

averaged twenty-one months of complete disability before operation. The first case was operated on in October, 1920. The cases operated on since this report continue these extremely gratifying results. Dr. Hamilton, the cardiologist of our clinic, has repeatedly stated, also, that he believes there must be an occasional thyro-cardiac in every medical community suffering from cardiac decompensation, hopelessly disabled so far as medical treatment is concerned, but potentially curable by surgical treatment, once the underlying thyroidism is discovered.

THE USE AND ABUSE OF THE OBSTETRICAL FORCEPS*

W. P. Tew, M.B., F.R.C.S. (Edin.)

From the Department of Obstetrics and Gynecology, University of Western Ontario, London, Ont.

SPEAKING in a general way, one may say that obstetrical forceps have rendered greater assistance to womenkind during labour than any other mechanical apparatus. At the same time, this instrument has done more harm to womenkind than any other mechanical device used in obstetrical and gynæcological work, with the possible exception of the curette. When the curette is in use, there is usually only one life at stake, while with the use of the obstetrical forceps there are two lives usually to be considered.

Parturition is a perfectly natural event when the conditions accompanying it are natural. In normal cases, the attendance of midwives or obstetricians might be regarded in the light of luxuries. There are times, however, when the event no longer remains within physiological limitations. It is this class of case which, no doubt, prompted the physicians of ages past to mould an instrument for rendering assistance. The development of this instrument is interesting. I do not propose to go into the details of its evolution here, but would like to remind you of a few of its outstanding features.

The death of Rachel "in hard labour," as spoken of in the Book of Genesis, antedates the writings of Hippocrates by many centuries. The Book of Exodus makes mention of the fact that the Hebrew women were more easily delivered at childbirth than were the Egyptian women. Hippocrates tells us of the use of the crotchet, an instrument used for extracting a dead or dying child and evidently often piecemeal. It was not meant for the delivery of a living child. The Arabians, in the tenth and eleventh centuries, made use of an instrument for delivering a dead or dying child. They were destructive instruments with long teeth. The whalebone fillet was extensively used by the Japanese. The vectis was extensively used in Holland in the seventeenth century. This brings us up to the time of the use of the obstetrical forceps proper by the Chamberlain family. The forceps devised by Peter Chamberlain and models of its later improvements were found in 1813 in a secret closet in the old Chamberlain home. The characteristic features of the Chamberlain instrument were—its fenestrated blades, the cephalic curve, and a gliding lock. Smellie, in England, in 1779, improved the Chamberlain instrument by adding a pelvic curve, wooden handles, and a better lock. Levret, in Paris, modified the Chamberlain forceps in a somewhat similar way. In 1783 Stein attached a dynamometer to the forceps in order that the exact amount of pressure could be determined. Tarnier, in Paris, added the axis traction rods. The development of the obstetrical forceps is briefly as follows: Smellie's modification, 1729; Levret's modification, 1729; Tarnier's modification, 1875.

This brief history of the development of the obstetrical forceps will serve our purpose. We must now pass on and say something concerning its use. As stated before, forceps have doubtless, a very definite field of usefulness. I would like to emphasize this particular part of

*Delivered before the Sudbury Medical Society, June 19, 1925.

the paper because we all know that, with injudicious use, the obstetrical forceps become most dangerous instruments. Now let us confront ourselves with the question: When should forceps be used? Before answering this question, I wish to state that we will speak of their use here only in vertex cases, and that we will speak of them as high, mid, and low forceps. The application of "high" forceps signifies their use before the bi-parietal diameter of the skull has become engaged in the brim of the pelvis; of "mid" forceps means their use with the bi-parietal diameter of the fœtal skull engaged in the brim of the pelvis; of "low" forceps, their application after this same diameter has passed the brim of the pelvis and the vertex or some other part of the fœtal skull is now on the pelvic floor or perineum.

When should we use high forceps? This is a most vital question, and one that requires our best attention. We cannot look upon this lightly. I will give you evidence to this effect later in my paper. I do not question for one minute but that each one of you here can quote personal experiences which will corroborate my conclusions regarding the use of high forceps. Now let us discuss the real indications for the use of high forceps. We may at first name several apparent ones, yet on second thought we have certain alternative procedures which answer the purpose more satisfactorily. Briefly, I would say that the indications for the use of high forceps are, certain grave dangers to either the mother or child, e.g., serious cardiac complications of the labouring mother, or a failing fœtal heart, as in a case of prolapsed cord. If such a grave situation presents itself, we must bear in mind the primary requisites permitting the application of high forceps, namely, (1) A bony pelvis which is within normal limits; (2) a fœtal head which is not too large to pass, and is in proper position for extraction; (3) prolonged labour, i.e., prolonged second stage; (4) there should be no tumours, either bony or soft, obstructing the passage; (5) the cervix must be sufficiently dilated; (6) a living child is not an essential.

A considerable number of forceps cases come under the heading of prolonged labour. We must be careful with this particular question. If the second stage is unduly prolonged, there is usually a very definite reason. One of the most frequent I believe to be incomplete flexion of the head. If this is the case and the flexion cannot be corrected, we simply must be prepared to give the patient extra time. These are good cases for some forms of the so-called "twilight sleep." The patient deserves our sympathy and encouragement, but certainly not the premature application of forceps. She says "she is tired out"; and no doubt she is mentally very tired. The true criteria of fatigue in the mother are elevations of temperature and pulse rate; and in the baby, heart rate over 170 or below 100. In such cases the mother's temperature and pulse should be taken hourly, and the fœtal heart rate taken at least every two hours.

The delivery of this type of case usually completes itself normally if plenty of time is allowed. If, however, the head does not engage and delivery must be carried out by the obstetrician, I would seriously consider internal version in preference to high forceps, if the circumstances of the case would permit of such.

The indications for use of mid forceps are much the same as those just given for the use of high forceps. The dangers of the one are almost as great as those of the other. I therefore strongly advise against their use, except in cases where there is imminent danger either to the mother or baby.

The indications for the use of low forceps are more readily thought of and accepted. They are as follows: (1) Vertex delayed unduly on the perineum; especially in elderly primipara; (2) uterine inertia—and here pituitrin often gives good results.

Now let us consider what some of the dangers are attending the use of forceps. To begin with, we must remember that even the application of low forceps is not free from certain dangers, both to mother and child, yet the dangers I wish to speak of here are mostly met with in cases where either high or mid forceps have to be used.

1.—Dangers to the mother: (a) lacerations of cervix—may be due to unskilful application to the outside of cervical lips; (b) extensive vaginal and perineal tears; (c) fractured coccyx; (d) separation of symphysis pubis; (e) damage to sacroiliac joint; (f) sepsis.

2.—Dangers to the child—and "herein lies a long tale of woes." Injuries to the child may

be considered under the following two headings:

A.—Injuries to soft structures:

1.—Cerebral trauma—directly or indirectly: (a) cerebral œdema; (b) cerebral hæmorrhage; (c) trauma to brain substances from fractures or indentations of skull bones.

2.—Facial injuries—One of the common injuries being facial paralysis, which usually is but temporary.

B.—Damage to bones:

(a) Indentations; (b) fractures.

This very vital question of the causation of fœtal death has been recently receiving considerable attention in practically every civilized country in the world. Dr. Eardley Holland, of London, England, has reported his findings in 300 *post mortem* examinations of fœtuses that were viable but were born dead or died within a few days after birth. His work was evidently thoroughly carried out and his conclusions as to the causes of death were as follows:

Complications of labour	51	per cent.
Syphilis	16	" "
Toxæmias of pregnancy	10	" "
Chronic renal and other maternal diseases	2	" "
Diseases of placenta	6	" "
Fœtal deformities	5	" "
Cause of death unknown	11	" "

He concludes by saying that the complications of labour fall to the doctor. The value of pre-natal care of our obstetrical patients is well known and need not be further stressed. The most urgent reform now required is the improved training of the doctor and medical student. Fœtal mortality is not likely to fall appreciably until the standard of midwifery is raised. Holland's report is most interesting; it points out to us very clearly wherein we should be able to assist in lowering the fœtal mortality in this country. He calls particular attention to the fact that intracranial damage from the use or abuse of forceps plays a most important rôle in raising the mortality rate. Next to forceps delivery in danger to fœtus comes breech extractions.

The clinical manifestations of cerebral trauma are usually very evident in the majority of cases. There is usually certain muscular twitching, especially of the eyes, accompanied by a peculiar whining cry. Once the damage is done, one is nearly helpless concerning treatment. However, the essentials of treatment are—careful nursing, repeated spinal punctures, which sometimes help, and lastly, the removal of a localized hematoma, and the elevation of deep depressed fractures.

The meninges surrounding the brain and large venous channels really act in some respects as ligaments. They are able to withstand a certain degree of stretching, but beyond this they will certainly tear, and in tearing the enclosed blood vessels are often torn also. The tentorium cerebelli is the common site of such tearing. The degree of laceration and amount of hæmorrhage of course varies quite considerably.

It seems that even in the most skilled hands, we find a very high percentage of intracranial injuries when forceps are used. This particularly applies to the use of high and mid forceps. The use of low forceps is not accompanied with nearly so much danger, yet the use of low forceps is not free from danger by any means. In fact, we at times find at autopsy cerebral œdema or hæmorrhage in what was thought to be a normal confinement. There is very evident danger in all breech extractions. The meninges are very liable to tear with the delivery of the after coming head. How are we to assist in discouraging the use of the obstetrical forceps except in cases where we are certain that a very just reason for their use is confronting us? It seems to me that we can easily assist, if we approach each case methodically, and if we decide to use forceps only after all controllable factors of the case have been carefully considered, and there still remains at least one very good justification for resorting to forceps delivery.

Proper pre-natal care of the patient means that we know the size of the pelvis, and the relative size of the head to the pelvic brim. If the patient is a primipara we should know whether or not the head is engaging properly a few weeks before term. We should know whether or not the mother is a comparatively healthy individual. The only point remaining is that if during labour it is decided to use forceps, one must be able to apply the forceps properly, and learn to use the proper amount of traction.

Summary

1.—Forceps have a place in obstetrics, but it is up to the doctor to keep them in their proper place.

2.—With pre-natal care and sound obstetrical judgment and management during labour, the use of the obstetrical forceps will be appreciably diminished, and the fœtal mortality should proportionately decrease.

3.—If we, as doctors, fail to carry out our part of this very important work, we will find that the books of the future on obstetrics will contain more voluminous chapters on the abuse than on the use of the obstetrical forceps.

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URINARY RETENTION*

GORDON S. FOULDS, M.B., M.S.

Toronto

FOR normal urination, the urethra must be patent and there must be relaxation of the sphincter accompanied by contraction of the bladder. Therefore retention may be due either to obstruction in the passages, or to interference with the normal detrusor action. In each case the exact cause of the retention should be discovered before treatment is commenced. The conditions giving rise to retention are best considered according to the age of the patient.

In childhood, urinary obstruction may be due to phimosis, atresia of the meatus, impacted calculus or foreign body, or congenital valve formation. The first two of these conditions need no comment. Impacted calculi, though they may occur at any age, are relatively more common in children. The stone most frequently lodges just within the meatus where it can be felt on palpation; when in doubt a probe or small sound may be passed into the urethra and the click felt. A simple meatotomy will frequently suffice to make its passage possible. The other common location for impacted stone is in the prostatic urethra. It may be dislodged and pushed back into the bladder by the passage of a bougie. The nature of foreign bodies passed into the urethra is extremely varied. The history is usually the important factor in discovering the nature of the obstructing object. One of the commonest articles is the ordinary large-headed pin; the head has been pushed into the urethra till the point has disappeared. The point should be driven through the under surface of the urethra and skin and then so turned that the head is pushed back to the meatus and manipulated out.

Congenital valve formation at the bladder neck is not a common occurrence but is one which should not be overlooked. Children suffering from this form of obstruction give a history of difficult urination since birth. A distended bladder may be felt on abdominal palpation. In such cases the condition of retention with overflow is seen. If careful physical examination of the abdomen is omitted these small patients are frequently treated for ordinary enuresis of childhood until the cause of the condition is discovered. A small catheter will pass easily as the valve only obstructs the outflow. A suprapubic cystotomy should be done and the valve destroyed.

During young adult life, retention is most frequently due to the complications of gonorrhœa or to trauma. During a recent or recurring acute gonorrhœal posterior urethritis, urination becomes painful and congestion of the mucous membrane and spasm of the sphincters ensue. The history is usually sufficient to reveal the nature of the difficulty. In less severe cases, a hot sitz bath, which may be supplemented by the insertion of a belladonna and opium rectal suppository, will usually give relief. When these measures fail, a well lubricated rubber catheter may be passed. When the bladder has been emptied with a catheter it should be irrigated with 1/6000 potassium permanganate solution.

Peri-urethral abscess is easily discovered on careful examination of the penis. Acute prostatic abscess gives rise to characteristic pain.

*Read before the Ontario Medical Association, Toronto, May 7th, 1925.

A rectal examination should reveal the nature of the condition. In each case, the abscess should be opened without delay.

Accidental rupture of the urethra occurs from injury to the perineum such as a fall astride a fence or beam, the urethra being pinched between the external object and the pubic bones; or as a complication of a fractured pelvis. If the injury is in front of the anterior layer of the triangular ligament there will be bleeding from the meatus with extravasation of urine in the perineum, scrotum and penis; if posterior to it there will be extravasation of blood and urine between the two layers of the ligament. If the rupture is partial a rubber catheter may be passed; when a soft rubber fails a gum elastic Coudé catheter or even a metal catheter may be tried gently. If catheterization fails, a suprapubic drainage of the bladder and an external urethrotomy should be done joining the torn ends of the urethra. The majority of patients who have had such injury to their posterior urethra develop dense fibrous strictures which are very difficult to treat.

Stricture of the urethra is one of the commonest causes of retention in adult patients up to the sixth decade. With the exception of traumatic strictures, most patients give a history of having had gonorrhœa. The symptoms may have developed so gradually that they have been disregarded until acute retention occurs following alcoholic excess. Usually, however, there is a history of gradually developing difficulty in micturition and diminution of the size of the stream. In cases of acute retention, where spasm and congestion seem to predominate, hot sitz baths and the use of belladonna and opium suppositories may give relief. When this treatment fails or in those cases where spasm and congestion are not suspected of playing a major rôle, a sterile metal bougie may be tried. It is wise to use a larger size first, about 26 French; if this fails smaller ones may be tried. Sizes below 20 are dangerous and should not be employed. The most useful instrument in the treatment of smaller strictures is the Le Forte filiform and followers. The filiform is passed similarly to the usual whalebone filiform. In difficult cases, three or four filiforms are passed successively down to the stricture, then by gentle manipulation of first one then another eventually one will slip by and enter the bladder. The follower sound may then be screwed on, lubricated and passed as one would an ordinary metal bougie. By the use of these instruments many external urethrotomies may be avoided. Another point I wish to impress on you is the necessity of systematic dilatation of strictures.

A sound or filiform and followers having been passed, subsequent dilatation should be done at intervals of six to eight days until a No. 26 sound can be passed with ease. After this the interval between treatments may be increased gradually, first to two weeks then a month and so on up to six months. I usually advise my patients to have a single No. 26 sound passed every six months for a period of two or three years.

In cases of prostatic enlargement the age of the patient is again suggestive, and there is usually a history of nocturnal frequency after four or five hours of recumbency, and of increasing difficulty. Lack of force to the stream is frequently noted, the urine falling almost vertically. Rectal examination will confirm the diagnosis. In cases of chronic retention pain may be absent and the patient is unaware that the bladder is greatly distended.

In cases of acute retention or in chronic retention where the amount of residual urine is small, a rubber catheter should be tried. If it fails, a Coudé gum elastic may be used, or following it if necessary, a rubber catheter on a steel stillette or a metal catheter with a prostatic curve may be tried.

At this point it may be well to again warn you against the dangers of too rapidly emptying the chronically overdistended bladder where there is dilatation of the ureters and back pressure on the kidneys. Rapid emptying of the bladder in these cases is followed by two definite sets of changes. The relief of urinary pressure allows a passive congestion of the mucous mmbrane of the bladder, ureters and kidney pelves, making a fertile field for infection. Secondly, it is followed by a marked fall in blood pressure, so diminishing the renal secretion and making infection easy. Fatal results from acute suppression of urine frequently follow such rapid emptying.

The bladder may be emptied slowly by placing a stopcock on the catheter and allowing only three to four ounces to escape each hour.

XUM

It is my practice to attach a tube about six feet long to the catheter. The tube is filled with sterile water and has a hooked glass tube on the opposite end to that which is attached to the

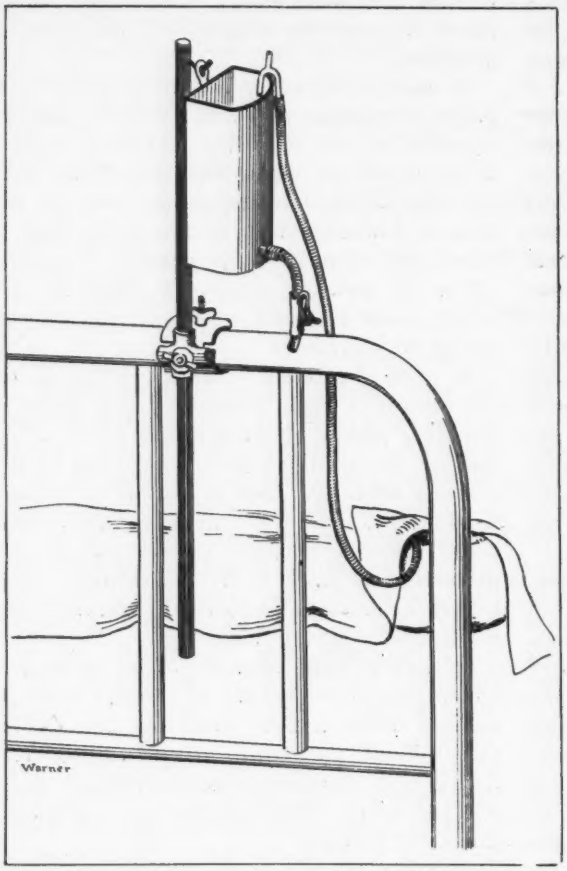

FIG. 1.—Apparatus for the gradual withdrawal of residual urine.

catheter. This hook is placed over the edge of a receptacle hung at the foot of the bed at a level so that the urine drips over drop by drop. The receptacle is lowered one to two inches per day and two to four days may be taken to empty the bladder. I have already reported eighty-three cases treated in this way, of which forty-six had bladders distended to the level of the umbilicus.[1] Of these forty-two had complete prostatectomy and the remainder had palliative procedures such as suprapubic drainage. There were only two fatalities in the series.

Once the bladder is emptied one must keep it empty and not allow it to become re-distended. Where there is definite residual urine of over two ounces, with definite prostatic obstruction, prostatectomy is indicated. Careful preoperative care and preparation is very important. The bladder must be drained by an indwelling catheter or suprapubic cystostomy until renal function has improved to as great an extent as possible. Study of renal function is essential. The fluid intake must be watched and patients encouraged to take fluids freely. A urinary output of three quarts per day is desirable. Elimination by skin and bowel should be favoured. In addition to this the efficiency of the cardiovascular system is important. Many of the deaths after prostatectomy which are attributed to renal failure are in reality due to a cardiovascular insufficiency resulting in lowered blood pressure followed by diminished renal secretion. Suitable preoperative treatment of cardiac disorders will do much toward lowering the mortality rate after prostatectomy. Postoperative management is largely a continuation of the preoperative care.

Carcinoma of the prostate occurs about once in each five cases of prostatic enlargement. The diagnosis is made largely by rectal examination. The gland is enlarged, very hard and irregular, the enlargement may extend beyond the usual limits of the gland into the area of the seminal vesicles. The median furrow is obliterated. Approximately 28 per cent. of all these cases have metastasis when they seek relief. A history of sciatic pain is suggestive of metastasis. Metastasis is usually discovered in the bones of the lumbar spine and pelvis and the femurs by x-ray examination. I am skeptical as to the value of treatment by x-ray and radium in the majority of cases. In selected cases they may help. Prostatectomy may be advised in a small carefully selected group of cases.

Another cause of urinary retention in older patients, which is not so well recognized, is disease in the central nervous system. The most common example of this type is seen in patients suffering from tabes dorsalis. Many of these patients have few urinary symptoms. Some hesitancy is frequently noted. They frequently boast of having recently had a "strong bladder" and can retain their urine without discomfort

for many hours at a time. Later, when distension is great, overflow takes place. In this type of retention, catheters pass without obstruction and without discomfort to the patient, as there is diminished sensation in the bladder and urethra with relaxation of the sphincters. Examination will reveal absence of the knee jerks and typical changes such as the Argyll-Robertson pupil and Romberg's sign.

The treatment is the treatment of the syphilis, and in the meantime catheters must be used to keep the bladder empty. The greatest improvement is seen in cases early in the disease in which the bladder is only moderately affected. This condition should be borne in mind as it may be associated with moderate prostatic enlargement and may be overlooked. A prostatectomy done in such a case is followed by most unsatisfactory results.

Other conditions in the nervous system giving rise to bladder disturbance are arteriosclerosis affecting the bladder centres, myelitis, spinal cord tumours and traumatic injury to the cord.

In conclusion, I would impress on you the importance of accurate diagnosis of the cause of urinary retention. When the retention is acute, immediate relief may be necessary but in all cases the cause of the condition should be investigated.

In cases of stricture the systematic dilatation over a fairly prolonged period of time is advisable. The use of filiforms and followers is often a valuable aid in the dilatation of strictures of small calibre.

Too rapid emptying of the chronically overdistended bladder is dangerous.

Retention of urine due to lesions in the central nervous system may be associated with some enlargement of the prostate and in these cases prostatectomy is unsatisfactory.

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BLADDER NECK OBSTRUCTIONS—HOW CAN THE OPERATIVE MORTALITY BE LOWERED AND THE END RESULTS IMPROVED*

DANIEL N. EISENDRATH, A.B., M.D.

Chicago

AS practitioners you see these cases as one of two pictures:—(a) A man whose bladder is more or less distended and who is unable to urinate, or (b) one who gives the clinical history of either difficulty, or frequency of urination, extending over a period of months to years. Before we take up the diagnosis and treatment of these two different stages of the same affection, let us see whether they are due to a single type of obstruction or atony, or whether one or more of a number of factors play a rôle in causing these symptoms. In other words, unless one is able to visualize the local changes in the urinary tract, as well as those of the body in general, it is impossible to understand why so much care should be exercised in the treatment of cases of bladder neck obstruction and atony.

Let us first consider the local changes. The symptoms of acute or chronic retention for which you are consulted, may be the result either of some form of mechanical obstruction at the bladder outlet, or some disturbance in the dynamics of the mechanism of urination in the form of weakness (atony) or even complete paralysis of the muscle (detrusor) which expels the urine under normal conditions, from the bladder.

In former years, the enlargement of the prostate was considered to be the only cause of such obstruction and other forms of bladder neck obstruction to be negligible. This viewpoint,

*Read and illustrated by slides, before the Western Ontario Academy of Medicine, at its April 21, 1925 meeting, held at London, Ontario.

however, has undergone modification so that we must now include the following:

(a) *Adenoma of the prostate.*—The enlargement at the bladder neck which we have always termed "prostatic hypertrophy" has been found to be a neoplasm, a true adenoma or fibroadenoma, which displaces the embryonic prostate, so that this is compressed to form the "false" or "surgical" capsule as we find it, at operation. The fact that the prostatic enlargement is a true neoplasm, serves to explain why evidences of malignant changes (carcinoma) are found in nearly twenty per cent. of the cases—something to be borne in mind both in our preoperative study and in our gross and microscopic study of the specimens removed.

There are two anatomical types of prostatic adenoma; one in which the growth only surrounds that portion of the prostatic urethra which lies behind the verumontanum, and a second, in which not only the prostatic urethra is enveloped, but the growth protrudes to a greater or lesser extent into the bladder lumen. The first has been termed the subvesical form, because it raises the floor of the bladder. The second is called the intravesical form, because of its encroachment upon the bladder lumen.

(b) *Contracture of the bladder neck.*—An overgrowth of the fibrous, muscular, and to a lesser extent, glandular elements around the bladder neck, often leads to a constriction of the opening, with resultant symptoms indistinguishable from those of prostatic adenoma.

(c) *Median bar.*—In some cases, the development of a transverse ridge or fold just proximal to the vesical orifice occurs, which acts as a valve or obstruction to the emptying of the bladder, just as effectually as though a massive adenoma of the prostate had developed there.

(d) *Adenoma of the subcervical glands of Albarran.*—Although of small size (hazel nut), the effect of such an obstruction can be very serious, owing to the fact that it is like a small middle lobe of a prostate or a median bar and acts like a cord in obstructing the bladder outlet.

These four constitute the most common mechanical hindrances, but we must not forget that others like urethral stricture, prostatic cancer, calculi, etc., may also be present, or serve independently as the cause of the obstruction. Finally, there are two causes of acute or chronic urinary retention, which are usually not thought of, because they do not present a demonstrable obstruction.

These two are due to atony of the bladder muscle, which expels the urine, viz., the detrusor. Such muscular insufficiency occurs in certain diseases of the central nervous system, especially tabes, and also in old age, as the result of atony of the detrusor muscle. Either of these two may act in the same way as an actual mechanical obstruction of the bladder outlet.

Local and general effects.—Whether the inability to empty the bladder is due to an obstruction at its outlet or is the result of the lack of muscular power to empty the bladder, as occurs in old age, or in tabes, the effect on the bladder itself and on the upper urinary tract is very much the same.

In the cases of bladder neck obstruction the wall first becomes thicker and later on, thinner. At the same time one finds little herniations of the mucosa called false diverticula, which favour the recurrence of infection. If larger diverticula are present as the result of a congenital anomaly, they may attain such a size that when they are overlooked before, or at the time of operation, they may be the cause of the persistence of the symptoms which characterized the original conditions. Many of the cases in which the pyuria is not benefited by relief of the obstruction are due to the retention of infected urine in these large pockets which may attain the size of the bladder itself, and only communicate with the lumen of the latter by an opening so small and poorly situated for drainage purposes, that although the patient is able to empty the bladder itself, much fluid is still retained in the diverticula. The formation of calculi in one or more of three places is a quite common complication. Such calculi may form in the bladder proper, in the shallow or false diverticula which lie between the more or less prominent trabeculæ (due to muscular overwork) or finally, they may form in the larger diverticula and be easily overlooked, unless one combines an x-ray with a cystoscopic examination.

The concomitant presence of an adenoma in the anterior and of a carcinoma in the posterior half of an enlarged prostate must also be borne in mind. Such a combination occurs in about 20 per cent. of the cases. Again, the stagnant

conditions within the bladder lumen favour the development of both benign and malignant growths. Not infrequently one will find a benign neck obstruction and either close to it, or at some distant place, a neoplasm of the bladder wall proper.

The damage to the upper urinary tract is at first seen in the ureters and renal pelvis, and later in the parenchyma itself, or even in the periureteral and perinephritic tissues in the form of abscesses. In order to understand these changes, it is desirable to bear in mind that although back pressure alone is the chief factor at an early period, it is only a question of time before infection occurs and this is an added complication.

The kidney suffers in one of three ways—first, there is more or less atrophy of the parenchyma as the result of the back pressure; second, the renal tissue is invaded by micro-organisms, with subsequent formation of miliary or larger abscess; and finally, it is important to remember that either or both of these forms of damage may take place in a kidney which is already the seat of a chronic interstitial or parenchymatous nephritis. It is this latter complication which after operation often defeats our best efforts. One must not be deceived by cases in which there is a polyuria and all of the evidences of dehydration, because the former may be simply the expression of a chronic nephritis.

Now as to the general, i.e., systemic effects of obstruction or atony of the bladder. The inability of the kidneys to eliminate waste products of metabolism results in their retention, both in the blood and in the tissues. For this reason it is essential to have frequent determinations made during the period of preparation, of the amount of urea and creatinine in the blood. The symptoms of such retention are too familiar to require more than passing mention. The thirst, dry tongue and skin, apathy, emaciation, hiccoughs, etc., indicate the toxæmia incident to the effects of the back pressure on the kidney.

When infection supervenes the clinical picture changes somewhat. Frequent recurrence of attacks of chills, fevers, and sweats, or a persistent temperature predominate, and when added to the symptoms just mentioned, constitute a picture which once seen, is not easily overlooked a second time.

The symptoms of toxæmia or of bacteriæmia which may complicate bladder neck obstruction or atony, may be far less marked than I have just outlined. The effects on the heart, lungs, liver and vascular system can be equally severe, yet the outward expression more subtle. The visceral damage begins to count when the question arises as to how good an operative risk the patient is.

Necessity of thorough preoperative study and preparation.—The bird's eye view I have given of the local and systemic effects emphasizes the necessity of "making haste slowly" in both the acute and chronic retention cases. If you are called to attend a patient whose bladder is greatly distended there is one guiding principle to remember, and that is, never to empty the bladder too suddenly. If you do not possess any special apparatus such as that suggested by Bumpus and Foulds, for gradual decompression, leave a catheter in the bladder and give instructions to permit one or two ounces to escape every hour.

A sudden fall in blood pressure will at times follow a rapid evacuation of the bladder and result in anuria or the acute renal congestion be followed by a severe hæmaturia, through the sudden lowering of the back pressure on the kidney. The bladder having been gradually emptied, the next question which arises is to consider whether some form of relief to the bladder neck obstruction should not be carried out and if so, to prepare the patient for such a procedure.

I will outline as briefly as possible an ideal plan for such preoperative study and preparation. In our clinic we are usually successful in following the major portion of the procedures in nearly every case. First, the examination of the patient should, if possible, include the following in the order named:

(a) Examination of the cardiovascular and nervous systems.
(b) Estimation of blood pressure and coagulation time of blood.
(c) Blood chemistry, especially urea and creatinine.
(d) Fluid intake as compared to output.
(e) Excretion of phthalein over a two hour period.
(f) Rectal examination for carcinoma of prostate or vesicles.

(g) Examination of urethra for stricture.

(h) Use of cysto-urethroscope to ascertain type of vesical neck obstruction as described earlier in this paper, and also to see whether there are any complications (intravesical) in the form of calculi, neoplasms or diverticula.

(i) An ordinary x-ray of the entire urinary tract so as to avoid overlooking any renal or ureteral calculi.

(j) Cystography to learn whether bladder reflux is present and to ascertain the size, location and number of any vesical diverticula.

(k) Determination of amount of residual urine. This usually precedes the local bladder examination.

This list at first glance seems a formidable one, yet you would be surprised to observe how easy it is to carry out the various steps of such a complete urological study and how much post-operative trouble one can avoid by employing them.

The amount of residual urine is not always the factor which decides in favour of operative relief. It may be relatively small and yet the evidences of local and systemic damage may be relatively great. It is equally surprising at times to find a large amount of residual urine and yet signs of back pressure be comparatively slight. In order to be a safe risk the urea should not be over 30-40 mg. per 100 cc. and the creatinine not over 1.5 mg. per 100 cc. A phthalein output of less than 30 per cent. in two hours is too low to warrant operative precedure. Of as great importance as all of these tests is the improvement in the general condition of the patient as evidenced by a good appetite, moist skin and tongue, ample output of urine having nearly normal specific gravity, and an absence of the anæmia so commonly seen in urosepsis.

The writer greatly prefers the use of the in-lying catheter to a suprapubic cystostomy for drainage.

During the period of preparation attention should be paid to the following:

(a) Encourage the patient to drink a glass of water every hour during the day. We seldom find it necessary to force fluids by mouth or to give a daily hypodermoclysis.

(b) Give foods which are easily digestible and lessen the tendency to acidosis. Orange juice is of especial value in this direction.

(c) If we have any reason to suspect that the patient is a "bleeder" we give blood serum hypodermically in the form of thrombo- or hæmoplastin.

(d) If it has been necessary to employ the inlying catheter, this is changed every four days.

(e) If there is much pus in the urine, daily irrigations with antiseptic solutions such as potassium permanganate, or weak iodine, are given. Recently we prefer to inject a smaller amount of one of the newer drugs like acroflavine 1.500, or mercuro-chrome—one ounce twice daily of a one per cent. solution. This daily care of the bladder, especially if supplemented by urotropin and acid phosphate or the newer hexlyresorcin, will often accomplish wonders in clearing up a cystitis during this period of preparation.

(f) In patients over fifty we ask consent to perform a bilateral ligation of the vas under local anæsthesia and also a meatotomy at the same sitting. The bilateral vasectomy is employed as a prophylactic against epidydimitis, which is a complication either pre- or post-operative in 20 per cent. of all cases in spite of every effort to prevent it. The object of the meatotomy is to permit the passage of sounds up to 30 F. in the after treatment so as to prevent stricture formation at the vesical neck. Since performing these two operations in cases of bladder neck obstruction and atony as a more or less routine measure during the past year, we have found the post-operative care to be greatly simplified.

(g) Do not fail to have the urine constantly examined for sugar lest we have a diabetic coma or wound gangrene as an unwelcome and unexpected complication. With the aid of an internist who has had experience in the treatment of diabetes, such cases can be made safe risks through appropriate preoperative care.

The remainder of the subject which I have taken up to-day is chiefly of interest to those who, like myself, specialize in urology, hence I will merely give an outline of the types of operation and the preferable method of anæsthesia and the more important post-operative complications as follows:

Types of operation.—1.—For median bars of the fibrous type and bladder neck (collar) contractures the cautery punch is to be preferred, using caudal anæsthesia.

2.—For thicker median bars (glandular type) and Albarran nodules a suprapubic operation under combined sacral and field block anæsthesia.

3.—For a hard fibrous prostate more or less completly surrounding the prostatic urethra—the sub-vesical type described earlier—we prefer the perineal route under "sacral block."

4.—For the large prostate which protrudes into the bladder lumen to a greater or lesser extent, we can employ either the perineal or suprapubic route, according to the custom of the operator. The operative mortality is practically equal in the hands of those with large experience and the chances of post-operative sequelæ about the same.

We prefer a one step operation in the case of prostatic adenoma if it is possible.

Post-operative Complications

The more important are:

(a) Immediate or late bleeding due to insufficient care at time of operation; to systemic conditions preventing proper clotting, and to sepsis (late).

(b) Anuria or uræmia. Will occur at times in spite of every precaution as result of an underlying chronic nephritis.

(c) Hiccough, usually due to acidosis and relieved by daily intravenous administration of 250-500 cc. of 10 per cent. dextrose solution.

(d) Acute gastric dilatation, can be avoided by limiting quantity of fluids given by mouth during first few days after operation.

(e) Cardiorespiratory complications. Greatly lessened since we employ sacral and field block instead of general anæsthesia.

(f) Persistent fistula and stricture formation. Less danger since we have learned to open the bladder at the highest point in the suprapubic cystostomy and to improve the technique of the operation and after-care with sounds, etc.

(g) Epidydimitis, eliminated if vasectomy is done prior to operation.

I have attempted to cover the subject in as non-technical a manner as possible and hope that it will impress you with the necessity for great care if we wish to decrease our mortality and morbidity.

Insomnia.—In the Section of Neurology and Psychological Medicine of the British Medical Association, Dr. Robert Hutchinson initiated a discussion on insomnia. He divided insomnia into two classes, primary and secondary, the latter being due to some physical discomfort, such as pain, fever or cough. The primary cases were due either to mental discomfort or to the memory of it. The treatment of insomnia due to physical discomfort was necessarily the treatment of that discomfort. In the case of primary insomnia, the patient had probably been exaggerating in his own mind the results of not sleeping, and one might certainly explain to him that there was no fear of his either dying of insomnia or of going mad as a result of it—both of which dreads probably had been preying on his mind. One might also point out that health could be maintained on a much smaller allowance of sleep than most people habitually took, and that complete rest and muscular relaxation were to a large extent a substitute for it. If the patient could only be made to take up this mental attitude to his trouble, it was a big step towards curing the insomnia, for the latter was often being kept up through autosuggestion; the patient did not sleep because he went to bed dreading that he would not. If he could be made to snap his fingers at the insomnia, it would often disappear.—Correspondence, *Jour. Am. Med. Ass.*, Aug. 8, 1925.

GASTRIC AND DUODENAL ULCER; DIAGNOSIS, TREATMENT, AND INDICATIONS FOR SURGERY*

F. B. MOWBRAY, M.B., F.A.C.S.

McGregor-Mowbray Clinic, Hamilton, Ont.

THE stomach and the duodenum, as far as the entrance of the common bile duct have a common development and blood supply, possess acid contents and are subject to similar diseases. Both are developed from the foregut and are supplied by blood from the coeliac axis artery. The remainder of the duodenum is derived from the midgut and it receives its blood supply from the superior mesenteric artery.

Of the non-malignant diseases affecting the stomach and duodenum, gastric ulcer and duodenal ulcer are the most common and by far the most important. Since duodenal ulcer is found (practically always) in that part proximal to the papilla of Vater, and is found only in an acid medium, it seems logical to discuss this condition along with gastric ulcer. These two lesions therefore constitute the true peptic ulcers.

These ulcers are of no mysterious identity and are not diseases due to one special and peculiar cause. Just as ulcers may occur in various parts of the body, such as skin or mouth, etc., due to a variety of local or general causes, so may they occur in the stomach and duodenum. Ulcers elsewhere may be produced by varying agencies such as trauma, interference with blood supply, infection, etc. The same is true of the peptic ulcer. The presence of gastric juice provides another factor which greatly aggravates the ulcerative process once it has started.

The trivial lesion which on the skin would never develop into a sore, may in the stomach rapidly become converted into an ulcer, owing to this digestive action. It is well known that most ulcers of the skin tend to heal promptly, while others tend to become chronic. In the stomach, must not such a tendency to chronicity be much more probable when they are handicapped by gastric juice, and the normal functional motility, plus the irritation from food? A peptic ulcer no doubt arises from the same type of lesion as precedes ulcer in other parts of the body, but it owes the peculiar appearance by which it differs from all other ulcers, to the action of gastric juice.

Peptic ulcers may be acute or chronic. Necessarily every ulcer commences as an acute ulcer. In many cases this gives rise to no clinical symptoms and in the course of three or four weeks it has healed, leaving behind little or no scar. When one considers how perfectly the epithelium of the stomach blends with that of the jejunum at the stoma of a gastro-enterostomy, one can easily believe that an acute ulcer of considerable size may heal, leaving behind it a scar which may be impossible to detect, without the most searching examination. Acute gastric ulcers are frequently multiple and situated on the anterior or posterior wall near the lesser curvature, and differ from chronic ulcers by being more often found in the cardiac end than in the body of the stomach. This probably means that ulcers near the cardia heal with greater readiness than those toward the pylorus and beyond it. Undoubtedly, some of these acute ulcers are mere slits in the mucosa, so small as to defy detection, but which nevertheless, may give rise to serious hæmorrhages. As only a very small percentage of superficial ulcers anywhere in the body tend to become chronic, it is reasonable to suppose that very many acute gastric and duodenal ulcers heal up promptly with very little scar and complete subsidence of symptoms.

I cannot explain why chronic ulcer should occur with progressive frequency as one travels from the cardia toward the papilla of Vater, but the fact remains that ulcers occur in the proximal two inches of duodenum, at least four times as often as chronic ulcers in all parts of the stomach combined. Whether we may seek for the cause of this in the anatomical distribution and type of the blood supply, or in

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the chemical action of the gastric juice or whether it may be due to trauma from food, I do not know.

A chronic ulcer, whether of the stomach or duodenum, is a visible and palpable lesion, which has existed for months or years. In it can be seen both the evidences of destruction, and of a stubborn defence. There is a crater of varying size. In depth, the ulcer involves at least the muscular coat, and it may extend through all the coats. If acute perforation does not occur, slow chronic perforation may occur, producing firm adhesions between the ulcer and the neighbouring organs. Thus it comes about that frequently the base of such an ulcer is in the liver, the pancreas or in some other adjacent structure.

The non-perforating type of ulcer is the cause of symptoms, the chief character of which is the tendency to show intervals of freedom between attacks of pain. The cause of symptoms is not the ulcer alone, for in the intervals of freedom, the inert crater of an ulcer is still to be seen and open ulcers have been found *post mortem* in patients who never during life gave any history of indigestion or pain. It seems probable that an ulcer, especially in a perfectly callous state, does not provoke symptoms. One needs only recall the relatively small number of patients with acutely perforated large callous ulcers, who have had previous symptoms of dyspepsia. In my own limited practice, out of thirty-four acutely perforated ulcers, thirty were of the large callous type, and of these twenty-seven had not had sufficiently marked distress to consult a physician. We must therefore, look elsewhere than to the ulcer itself to account for the symptoms. I feel that the typical symptoms arise from the zone of mucosa immediately surrounding the ulcer rather than from the lesion itself. The base of chronic ulcers is almost certainly infected with pyogenic organisms and hence acts as a focus for the spread of infection and inflammation into the surrounding mucous membrane. This inflamed zone of mucosa varies in size and intensity according to the amount of infection present; and the amount of functional disturbance will be in like proportion. From this stage of acute inflammation of the mucosa, it is a very short step to superficial erosion or even acute ulceration. This spread of inflammation by continuity can account for the acute ulcers which one sometimes sees outside the chronic one. By contiguity this would also account for the "kissing ulcer" which one not infrequently sees in the duodenum, i.e. where there is an open ulcer on the posterior wall of the bowel directly opposite one on the anterior surface.

The symptoms are characterized by a certain rather definite rhythm of pain, relieved by food, alkalies, or vomiting, and by a tendency to remission of symptoms for weeks or even months at a time. In gastric ulcer, the pain rhythm differs slightly from that of duodenal, in that there is usually a period of relief when the stomach is empty, while in the former, pain is always worse at that time, giving rise to the well known expression of "hunger pain." In gastric ulcer, the sequence of events is food, comfort, pain, comfort, while in duodenal it is food, comfort, pain, food, comfort, pain.

In gastric ulcer, pain usually appears in less than one and a half hours after meals, while in duodenal it is seldom noted under two hours. The same meal will produce pain at almost the exact time, no matter when eaten, but different meals will cause the pain to appear at different intervals after eating. The time interval of appearance of pain is absolutely constant, providing the meals are alike. The time interval varies in different persons taking the same meal, so that each individual's time reaction is slightly different. Food and alkalies relieve pain in uncomplicated ulcer, but once a chronic perforation has occurred, this relief is either much shorter or altogether absent. Seasonal variation of symptoms occurs in both ulcers, but is much more common in duodenal.

Hæmorrhage and perforation are the serious complications of ulcer. Gastric hæmorrhage in a male, in the absence of cardiac, hepatic, or splenic disease almost certainly comes from a chronic ulcer, and indicates an activity demanding surgical help. Hæmatemesis in the female probably does not come from a chronic ulcer. It may come from an acute ulcer or be diffuse oozing due to some focal infection, frequently appendicitis, or again, it may be due to splenic disease. In duodenal ulcer both hæmatemesis and melæna may occur, the latter almost always in excess both in quantity and frequency.

XUM

An accurate history and a close scrutiny of the symptoms allows a diagnosis of duodenal ulcer to be made with a considerable degree of confidence. One should always hesitate to diagnose gastric ulcer. A duodenal ulcer is a great deal more common than a gastric one, and its symptoms are much more uniform. However, there are so many conditions having their origin within the abdomen or outside it, which give rise to gastric discomfort, that even the most careful clinical history and examination may fail. We must therefore use other diagnostic measures and of these the x-ray in competent hands, is undoubtedly the most valuable. It is so trustworthy, that one should not diagnose or attempt to treat either gastric or duodenal ulcer without confirmatory evidence by x-ray. If a competent radiologist fails to demonstrate an ulcer, the clinician must accept the fact that none is there and that he himself was wrong in his diagnosis. There are only two certain means of diagnosing peptic ulcer, the radiological and by operation. Unless an ulcer can be seen, one can never be sure of its presence. When the abdomen has been opened the surgeon may demonstrate an ulcer by gently rubbing with gauze the peritoneal surface over a suspected area. This will always produce a stippling, if an ulcer is present.

At our clinic, we have done routine chemical gastric analysis for some time, but I must confess, that I am unable to say what gastric analysis findings indicate ulcer and what ones do not. Of course, the demonstration of a high terminal ascent in the fractional curve suggests duodenal ulcer, but it does not occur with sufficient frequency to be pathognomonic.

If I am right in my contention, that the symptoms of ulcer are produced by the inflamed zone of mucosa around it, and not by the uncomplicated ulcer itself, then I must also be willing to admit that causes other than ulcer may set up localized areas of inflammation in the gastric mucosa. Undoubtedly, foci of infection elsewhere have a bearing on gastric distress and we have seen typical ulcer symptoms disappear under treatment aimed at these other foci, rather than at the supposed ulcer. I have recently seen a woman whose history was so typical of duodenal ulcer, that the clinician rather doubted the radiologist's negative findings. However, the Wassermann test was positive, and appropriate treatment very rapidly cleared up her ulcer symptoms. It is a general principle in the treatment of peptic ulcer that all foci of infection, especially those located in the mouth and accessory sinuses, should be cleared up as a preliminary, and not infrequently these measures alone cure the so-called gastric ulcer. When one considers the number of times some of our *real* ulcer patients have been "cured" before finally choosing surgery, one must believe that some condition secondary to the ulcer has been cured and not the real lesion itself. In fact, I am quite convinced that it is this secondary condition, namely, the zone of inflamed mucosa, which is cured either by dietetic or medicinal means or cures itself spontaneously, only to recur when some local or general lowering of resistance permits a re-infection from the open crater of the chronic ulcer. Indeed, I feel that very many of our imperfect results following gastro-enterostomy alone, are due to this factor. I believe that it is as essential to remove the latent focus in a chronic ulcer in order to attain results, as it is to do a gastro-enterostomy.

In my opinion, medical treatment is doomed to fail in that very essential aim, namely, the complete healing of the ulcer. The inflammatory zone can and probably will improve or completely disappear, but the hard indurated callous ulcer with overhanging edge will probably go on forever. Just think with what unremitting attention, one must treat a chronic ulcer of the leg and what meticulous care must be exercised to avoid the little knock or bump which will cause it to break down. How then can we hope by diet, alkalies, bismuth, and stomach lavages to undo the ravages of gastric juice with the resultant induration and ulceration in an organ which cannot be kept still and which must function several hours each day? Sir Berkeley Moynihan cites a case of gastric ulcer, which required three and three-quarters years to heal in spite of all food being given through a jejunostomy, and not one bit by mouth. The medical treatment especially in general practice is necessarily haphazard and perfunctory. The average person has neither the time nor the patience to carry out adequate treatment over a sufficiently long period. Very few people are willing to undertake treatment whole heartedly, and there is always the tendency to shirk the prolonged supervision which is necessary after

their symptoms have apparently disappeared. One would expect that many weeks or months would be required to complete the healing of an ulcer with a large surface, a deep crater, and a hard, unyielding edge and this under the very best conditions of rest in bed, restricted diet, appropriate drugs, plus clearing up of all foci of infection.

The Sippy treatment is based upon small meals of bland food given at frequent intervals and preceded by an alkali during the day and provides that the stomach shall remain empty and clear during the night; this is probably the most satisfactory type of medical treatment; it certainly does relieve symptoms. Does it cure the ulcer? Not in the hands of the average practitioner. The treatment of the ulcer does not consist of light work, soft diet, and a bottle of bismuth and soda for a month. If the patient is to be well treated by medical means it must be rigid and systematic. It may, and probably will be, an unpleasant and prolonged process, more unpleasant and more expensive than the surgical. If a practitioner is willing to accept subsidence of symptoms as a cure, I am willing to admit that he will "cure" patients repeatedly. Let him bear in mind that his ultimate mortality from perforation and hæmorrhage will be a greater risk than the surgical one in uncomplicated cases, while the earning power of the patient, to say nothing of his distress and suffering, will be diminished in proportion to the number of "cures" the doctor finds necessary. I do not wish to be understood as condemning medical treatment. I feel that every patient should be given the benefit of adequate medical care. Medical measures, in addition to relief of symptoms, are of aid in demonstrating the need for surgery. Undoubtedly, patients are better surgical risks after preliminary medical treatment with rest in bed.

Indications for surgery must be based upon unmistakeable signs of ulcer as seen by x-ray. Failure after two months of efficient medical treatment applied to the first attack demands surgical cure. This allows sufficient time for the healing of an acute ulcer. Hæmorrhage of any amount demands absolute rest in bed, liberal doses of morphine, plus careful rectal or subcutaneous administration of fluids, and nothing whatever by mouth. Hæmorrhage of a severe degree requires transfusion. As soon as the patient has recovered sufficiently to warrant an x-ray examination, this should be done and the ulcer demonstrated. This should be followed by the standard surgical treatment as in any uncomplicated ulcer. If an ulcer is chronic, pain severe, the tendency to bleed noticeable, or the patient over forty years the need for surgery is urgent; decided pain or hæmorrhage indicate a likelihood of early perforation. Chronicity may render operation more difficult while an age over forty always suggests possible carcinoma. Acute perforations of course demand surgery and that urgently. Acute perforations are more common in duodenal than in gastric ulcer, for duodenal ulcers are usually on the anterior surface, while gastric ulcers are oftener on the posterior, and therefore more likely to escape the tragedies of acute perforations. Chronic perforations, although not requiring surgery so urgently as acute ones, can nevertheless be cured in no other manner.

Operation is not the conclusion of treatment and should be regarded as the first stage only. During the next six months the patient should be under observation and eat appropriate and easily digested food; lead a regular easy life and refrain from overwork. Medical treatment is of the greatest value as a supplement to surgery, but not as a substitute for it. The success or failure of operation depends very largely upon the way the patient is treated during this period following the operation. We must also remember that though we may cure a peptic ulcer by surgery; when cured that patient may still be liable to attacks of indigestion, as would any normal individual. If as a result of indiscretions of diet, overwork, or for any other cause, he occasionally has attacks of indigestion, let us not assume that the ulcer has returned or that operation has been a failure.

XUM

CANCER OF THE LOWER LIP

W. HERBERT MCGUFFIN, M.D.

Radiologist, Calgary, Alta.

THIS very common malady has been the subject of discourse upon so many occasions that you will wonder what more can be said at this time. It is only because I have had so many cases of lip cancer, in comparison with malignancies in other locations, that I have chosen this topic. There is nothing new in the literature* dealing with the cause of or cure for cancer. The treatment in my practice has taken on a definite line of procedure, and it is my intention to try to describe these methods to you in detail. By way of introduction, let us consider a few of the main points pertaining to the diagnosis, classification, symptoms and conditions which are forerunners of cancer of the lip.

There are two outstanding features:—(1) Cancer of the lip lends itself to early diagnosis; (2) malignancy in this area is very accessible to treatment.

Occurrence in order of frequency.—(1) A man, over thirty, pipe-smoker, with a thickening of lip for one or two years; some crusting and repeated scab formation and later, an ulcer with raised edges. (2) An adult with "cold sore" which persists for two or three months with inflammation and pain. (3) "Cracked lip" which will not heal, and becomes thickened, inflamed and painful. (4) Keratosis with ulceration and thickening. (5) Verruca becoming inflamed and painful. (6) Leukoplakia with breaking down of the tissues.

Classification.—Pathologists agree that the majority of lower lip cancers are squamous celled. These epidermoid carcinomata are of two types; the superficial papillary, and the deeply infiltrating. The superficial papillary type responds favourably to light radium therapy; the deeply infiltrating variety requires more energetic treatment. Either of the foregoing types may develop glandular involvement.

Diagnosis.—The cases which have come to my notice have not offered any particular diagnostic difficulties. The history, plus the appearance and palpatory examination, has usually been sufficient evidence upon which to make a decision as to the nature of the lesion. A too prolonged or repeated digital examination is inadvisable as bruising these inflamed tissues may result in marked untoward local effects.

Microscopic examination.—Some medical men adhere to the custom of removing a section for biopsy. This may appear to be an innocent practice and to be advantageous in confirming the clinical diagnosis, nevertheless I am of the opinion that it has potentialities for harm. There is the great possibility of irritating the diseased area and thereby stimulating metastasis; infection may also follow, and disfigurement from the scarring is often a complication.

The superficial papillary type of epithelioma.—There is a small ulcer which scabs over at frequent intervals. If the crust is removed you will see small nodules which are characteristic of this type. There is only a slight degree of induration and there is practically no invasion of the deeper structures. There may be an exuberant growth of new tissue on the lip which bleeds easily when irritated. Salves and caustics have a tendency to stimulate the growth's progress.

The indurated or deeply infiltrating type of epithelioma.—These cases present a clinical picture which is diagnostic. Palpatory examination reveals an invasion of the growth into the deep tissues. There is an ulceration with raised indurated edges. The lymphatics, in this particular class in the early stages, do not exhibit any evidence of involvement. The patient usually complains of some pain, variable in degree, depending upon the extent of the lesion and the type of patient. There may be a discharge with the characteristic cancer odor.

Treatment Technique.

First type. — *Superficial papillary.* — The affected area is mapped out and a 10 mg. plaque, radium element, half strength filtered by .2 mm.

*The recent work of Gye on the infectious aspect of cancer had not appeared when this paper was written. [EDITOR.]

Al., 1 mm. of gauze, and one layer of rubber dam, is placed so that about half an inch of apparently healthy tissue surrounding the visible disease is included. An exposure of three hours is given to each area. A second exposure of six hours is then given to each square, using the same amount of radium but with an additional filter of .3 mm. brass. Following this treatment the patient is advised to bathe the affected part three times daily with 1 per cent. boric acid solution and apply a little borated vaseline (emphatically, nothing else). The area is not covered unless the patient has a dusty occupation or is exposed to rapid changes of the elements. He returns, if possible, each week for observation. If he lives out of town we tell him what to expect in the way of reaction. It has been my experience that within one week we get a blushing of the skin. By the end of the second week there is some swelling and commencing ulceration. During the third and fourth weeks there is a definite sharp reaction with some discomfort. This is not a bad omen because I find that the more severe the reaction the better the end results.

If the tissues are religiously kept clean and the lip protected from dirt and severe weather conditions, healing will be completed in from six to eight weeks. A smooth white surface is left; no thickening can be felt; the white appearance gradually fades and a normal colour returns. The part treated will be sensitive for a considerable time and the patient should be warned in order to prevent undue anxiety when the lip swells up after exposure to excessive heat or frosty weather.

Second type. — *Deeply infiltrating.* — Combined radiotherapy and surgical treatment are indicated. A good method to pursue in the care of these cases is as follows:—If there is a sloughing ulceration, apply warm wet dressing for a few days to clean up any secondary infection present. During this time give x-ray treatments to the cervical plexus of lymphatic glands on both sides of the neck and posterior mediastinum, using the following factors: 150 KV (sphere gap), 6 ma's, 13 portal, 50 cm. S-T distance, ¼ mm. copper and 1 mm. Al. filter; 45 min. to each area.

Treat each side of neck and posterior mediastinum for five minutes each day for nine days. Then apply radium locally. It is necessary to give a much heavier dosage than in the simple type. I use 50 mg's (4—12½ mg. needles), one inch of felt for distance, each needle occupying a space on top of the felt of 1 square inch. The whole package is covered with rubber dam and applied to the anterior surface of the chin for fifteen hours. For crossfire effect, radium is applied to inner and upper surfaces of the lip, 50 mg's (four needles) are enclosed in a roll of gauze in such a way as to keep the radium half an inch from the mucous membrane, and leaded rubber 6 mm. thick is used to protect the neighbouring parts. This package is enclosed in sterile rubber dam and fixed in position for nine hours to each area.

Surgical treatment should now be resorted to. This can be carried out advantageously in two operations. First, do a complete resection of the cervical lymphatics; this can be instituted while the affected area is recovering from the radium treatment. Second, at the completion of the radium reaction, do a resection of the involved tissues and as much beyond as is consistent with a fair cosmetic result.

This procedure, as outlined by me, may seem drastic and unnecessarily time consuming but from personal experience with a large number of cases I am firmly convinced as to its efficacy.

The appearance of the diseased area after radium and x-ray treatment often is of such a healthy nature that perhaps some of my auditors might be tempted at times to postpone operation. Here I wish to sound a warning—*never procrastinate.* It is much more excusable to err on the side of safety, and, from my experience, surgical intervention at this stage has always appeared to be warranted. Postoperative treatment is very essential and should be used as soon as the wounds have healed. I use the same x-ray technique as in the preoperative treatment. By this method we endeavour to establish sufficient defence to take care of any cancer cells which may still remain after the surgical operation.

Third type. — *Glandular involvement.* — The advanced stage of the disease is a truly radiotherapy case. No conscientious surgeon ever attempts to operate upon cancer of the lip when the glands of the submaxillary, sublingual, submental, and cervical regions are palpably enlarged. From a review of my own cases it is doubtful if radium and x-rays have ever done

any more good than to relieve pain, slow up the progress of the malignancy, and improve the morale of the patient. It is true that the first treatment usually has a pronounced beneficial effect. The lumps reduce in size, and the discharge and stench from the ulcerated area lessens. These good results are only short lived The disease, within a few months, takes on renewed activity. The tissues become radio resistant and a fatal termination ensues. My technique in these cases is similar to that used in second stage cases, with the exception that I now use a little heavier dosage of x-rays.

From experimenting with my present therapy equipment (The Victor-Snook Special) I find the following formula will produce a definite skin erythema within ten days of the completion of the treatments.

200 KV Sphere gap measurement (14 to 15 inch spark measured between sharp points). 6 ma's current; 13 cm. portal; 50 cm. skin; target distance; ½ mm. copper, and 1 mm. Al. filter; seventy-five minutes to each side of neck, ninety minutes to post mediastinum; each area treated for five minutes each day.

I have had no experience with the implantation of radon. The introduction of radium needles does not appear to be necessary in the treatment of a condition so easily reached as that of cancer of the lower lip. I have had no experience with electrothermic coagulation in my series of cases.

As to surgical treatment alone, to the exclusion of all other methods, I can best refer you to the article in the June, 1925 number of *Radiology* by Dr. Bloodgood. He indicates the surgical viewpoint as it relates to cancer of the lower lip. His arguments are good and the results obtained by him in the handling of such cases are satisfactory. I do not wish to take issue with Dr. Bloodgood other than to state that I believe the results secured by the method adopted in my series of cases have been fully as good, and probably the cosmetic results have been better.

The average physician and surgeon is not familiar with the value of radium and x-rays or, as is often the case, those handling them are not sufficiently acquainted with their uses, and the results obtained from treatments may be negative or even harmful.

My arguments with the surgeons usually filter down to two points; viz.: (1) Until cancer in its entirety can be circumscribed and excised by surgical methods, I am going to advocate the use of radiotherapy, as an adjunct both before and after operation. (2) The surgeon, radiologist, and physiotherapist should have a definite understanding as to the possibilities and limitations of their various methods of treatment. They should conscientiously use that treatment, whether it be medicine, surgery, radium and x-rays, physiotherapy, or any combination of these which offer the best results for the patient.

Supporting treatment.—Anyone dealing with a large number of cancer cases becomes possessed with the conviction that cancer is primarily a local condition but rapidly becomes a general systemic malady. In view of these facts it behooves us to look well to the whole body economy. Give explicit instructions as to cleanliness and the avoidance of all irritation similar to that which I have already outlined under the treatment of the papillary type. Prescribe tonics as seems necessary from symptoms complained of; such as pain, loss of appetite, constipation, and weakness. For pain, I find that five grain doses of acetylsalicylic acid, gives much relief. For loss of appetite, tincture of nux vomica in five minim doses in water before food, will be valuable. For constipation, liquid petrolatum alone or combined with agar-agar and phenolphthalein, will generally prove of service. For weakness due to impoverished blood, Blaud's Pill is still a good standby.

Diet.—It has been proven by Luden that cholesterol promotes cell proliferation (both normal and malignant). Luden has also proven that radium treatment will reduce the cholesterol content of the blood. Would it not be good logic to eliminate food, which is rich in cholesterol, from the diet of our cancer cases; viz., fresh milk, cream, cheese, butter and meat fats, eggs, fish and cod liver oil, and institute a diet consisting of a liberal amount of nuts, buttermilk, olive oil, lean meat, fresh fruits and vegetables, brown bread, honey, and water. A well balanced diet arranged from the foregoing will reduce the production of cholesterol and also acids.

Rest—Fresh air and sunshine.—Cancer patients improve more rapidly under the influences of rest in the fresh air and sunshine. Moderate exercise is permissible but the body

systems must not be taxed. Sunshine in abundance either utilizing the natural rays according to the method of Rollier or the ultra-violet radiation, as produced by the mercury vapor lamp. In our north western country I prefer the lamp. The treatments must be graduated according to the resistance of the patient. It is always well to expose the entire body, back and front, only a few minutes the first day, increasing the time each succeeding day in keeping with the skin tolerance. In all cases I am certain we obtain an improvement in the general metabolism and in many cases the effects are nothing short of wonderful. The one great handicap encountered, in my practice, is the inability to keep the patients long enough to give the course of treatments which I deem advisable. It would not be in order here to take up time in outlining the physiological effects of ultra violet radiation. Suffice it to say that there is a definite detoxifying action due to the increase of calcium metabolism.

It is useless to give a treatment and then dismiss the patient by simply telling him he will get better. You will obtain happier results if you take the time to tell him what to expect and what to do. It is a good rule to have the patient return as frequently as possible; in any event have him return on certain exact dates for observation, advice, and further treatment if necessary.

Summary

1.—Examine carefully such benign conditions of the lower lip as warts, cracked lips and cold sores, keratoses and leukoplakia, which are all forerunners of cancer.

2.—Classify the epitheliomata into superficial, papillary, deeply infiltrating, and glandular types.

3.—First type is a radium case.

4.—Second type should be treated by radium and x-rays, then surgery, and finally by radium and x-rays.

5.—Third type is a radium and x-ray case.

6.—Don't forget the hygienic and supporting treatment; such as, cleanliness and avoidance of all sources of irritation in the treated area; fresh air, sunshine and rest; suitable diet, and alleviation of co-existing symptoms.

7.—Follow up the progress of your cases.

In order that I may give credit where credit is due I wish to state that I am indebted to Dr. Douglas Quick, of New York, for the method of classification of lip cancers which I have adhered to for some years and which is so essential for the administration of the proper treatment. The cholesterol theory of Luden was alluded to by Dr. E. S. Lain in the *Journal of the American Medical Association*, October 16th, 1920. The dietetic application of the cholesterol theory, viz., omission of foods rich in cholesterol from the diet, is stressed in Robertson's *Biochemistry*.

I regret, owing to lack of equipment, that I am unable to designate in terms of electrostatic units the exact dosage employed in the x-ray treatments.

In the foregoing remarks it has been my ambition to give you the conclusions from a résumé of the case histories and progress notes of the patients referred to me rather than a rehash of other men's viewpoints as gleaned from the literature.

Visit of Madame Curie.—Mme. Curie, the discoverer of radium, has recently visited Czechoslovakia as the guest of the Czechoslovak government on her return journey to Paris from her native country, Poland. For the first time she saw the places from which the ore was brought, from which she succeeded finally in isolating radium. She visited, in Prague, the State Institute for the Study of Radium and the clinic of Prof. R. Jedlicka for the study of medical radiology. Accompanied by former pupils from her Paris laboratory, Mme. Curie visited also the watering place Jachymov, where she descended into the mine from which the ore was taken to be shipped to her Paris laboratory. Her chief interest was centred on the presence in the Jachymov ores of ionium, which she is studying at present and from which she expects further advances in the treatment of malignant growths because she anticipates that with ionium it will be possible to develop a more prolonged and moderate treatment than has been possible with radium.

NECESSITY OF EFFECTIVE ORGANIZATION IN PUBLIC HEALTH DEPARTMENTS

JOHN W. S. McCULLOUGH, M.D., D.P.H.

Chief Officer of Health for Ontario, Toronto

SIR GEORGE NEWMAN, the Chief Medical Officer of the Ministry of Health, England, after tracing the progress of public health during the last fifty years, asks the pertinent question, "What has been the result?" His answer is, (1) *A decline in the death rate.* In 1871-80 it was 21 per 1000 living; in 1924 it was 12.2; in the same period the infant mortality rate, a most sensitive index of national health, was brought down from 149 to 75 per 1,000, or expressed in another way, the expectation of life for every child born in Britain to-day is approximately twelve years longer than that of its grandfather.

In Glasgow in 1870-72 the male infant born in that city had an "expectation" of thirty-one years, which in 1920-22 had been raised to forty-eight years, and the female infant had risen from thirty-three to fifty-two in the same period.

(2) *There has been a reduction in sickness and invalidity* from certain diseases. In 1875, enteric (typhoid) fever accounted for 370 deaths in each million; last year this rate had fallen to twelve. In the South African War the incidence of typhoid was 28.5 per cent. of the troops; in the late war, 1 per cent. In 1875 there were 1,500 deaths in England and Wales from typhus; in 1924 there were but five. The tuberculosis death rate per million in 1840 was 3,189; in 1875 it was 2,313; in 1924 it had declined to 801. Small-pox in Great Britain a century ago was a national scourge; to-day it is the perquisite of those, who, neglecting vaccination, elect to have it.

In speaking of England and the extension of preventive medicine to remote countries, Sir George effectively quotes Kipling who writes:—"Smote for us a pathway to the ends of all the earth." Preventive medicine now permits the development of empires by its control of disease, especially in the tropics. The prevention of famine by the adoption of irrigation, the scientific transportation and preservation of food, and the control of diseases such as malaria, of yellow fever, of plague, of cholera and of sleeping sickness is permitting formerly uninhabitable regions of the tropics to be opened to trade. In the Federated Malay States, in India, in Panama, and in other tropical regions, the scientific application of public health knowledge has made fit for habitation with comfort, places heretofore but the grave of the white man.

Turning to the future Sir George Newman refers to the enormous toll of life taken by the respiratory diseases, organic heart disease, cancer, nervous diseases, tuberculosis and influenza; to the loss by death in childbirth of mothers, and to the annual deaths of 50,000 infants in their first year. These and the twenty-three million weeks of lost work due to illness, demand increased interest in and statesmanlike effort for the further reduction of the sickness, poverty and death due to preventable causes.

How does the progress in public health just recited compare with that of Ontario?.—Any concerted effort in public health began in Ontario in 1882, when the first Public Health Act was passed and the Provincial Board of Health established. There are no reliable records of the general death rates nor of infant mortality previous to 1900, but the present general death rate, viz., 11.8 (1923) compares favourably with that of England, and our infant mortality rate of 113.1 (1900) is now (1923) 84.9. The tuberculosis death rate has dropped from 148.6 (1900) to 65.6 (1923). In 1910 the typhoid death rate was 50.3 in cities; it is now (1924) 2.5. The smallpox death rate of Ontario is negligible, and there is a steady decline for years in the deaths from most of the preventable diseases.

Just as in England our deaths of mothers in childbirth, and of infants under one year, and deaths from cancer, organic heart disease and influenza range altogether too high, and the worker loses because of sickness periods of time which contribute largely to the poverty of his family. Much of this sickness is preventable.

The question "What of the future?" is as timely in Ontario as it is in England. There

Sir George Newman lays down three fundamentals for the successful prosecution of public health, viz., (1) A new local unit of sanitary government; (2) effective coördination of medical services; (3) public education in health.

(1) *A new local health unit.*—There is nothing so greatly needed in Ontario as the establishment of whole-time health units and the abolition of local health administration by small municipalities. *The real basis for local health administration is a competent organization constantly on the job in an area of suitable size and with a population financially able to bear the cost.*

The need for this basis must be as plain as a pikestaff. Competent management is the essential factor in any business, and neither public health nor any other business can show results unless properly managed. The small villages and towns and the rural townships are, by themselves financially unable to bear the cost of a proper health service. What is the obvious remedy? They should combine for this purpose, the combination being a county or part of a county, or, where adjacent counties are small, two might be united for health purposes. This matter of union is of such importance that every effort in public health, governmental and voluntary, should be directed to this end. Many agencies besides government, such as insurance companies, voluntary health boards and voluntary workers, are dribbling away large sums of money on this, that, and the other public health project without much lasting effect. If all this money were devoted to the concerted effort of uniting the small municipality health boards into combinations financially able to carry full-time health organizations, we should have before many years all over this province (and the same applies to the other provinces of Canada) sufficient local organizations of such a character, as to ensure that day in and day out the business of public health was being satisfactorily carried on.

(2) *Effective coördination of medical services.* The need of this is quite as apparent in Ontario as in England, but as far as coördination of the medical services in the aid of public health is concerned, nothing of any moment can be expected while the local health officer remains a part-time practising physician in competition for practice with his fellows in the same neighbourhood. All of them know that, as a rule, the medical officer of health is no more an authority on public health than any of themselves. If, on the other hand, as one sees in cities with a full-time health service, the medical officer of health is a trained man and is not a competitor in the practice of medicine, he at once gains the support of the local profession and the right sort of medical officer of health can do much in enlisting the support of his medical friends, in public health work. So that effective coördination of the medical services depends largely on the establishment of a full-time health service.

(3) *Education of the public.*—Any public health scheme which fails to provide for education of the public in these matters is, if not doomed to failure, bound to be slow of advancement. Obviously the government cannot reach to the uttermost parts of the 407,000 square miles of territory embraced within the boundaries of Ontario. Any education of this character now being carried on is done chiefly by the Provincial Department of Health or by the eight full-time municipal health organizations now existent. To be done effectively the work of *public health education* must be initiated and carried on by the local health unit with such direction and assistance as may be afforded by government. So we may surely assert that successful local administration, coördination of medical services, and public health education all depend upon *the union of municipalities* so as to provide an area of suitable size, population and financial stability for public health purposes. The experience of all countries where this plan has been adopted is that by it we secure satisfactory advancement in public health measures with co-operation of the medical profession, and rapid enlightenment of the public in the importance and need of sanitary and hygienic conditions; the incidence of disease and death is also lowered, protection is afforded to the mother and her baby; at the same time because of less sickness, there is greater comfort and happiness, and less poverty.

XUM

Case Reports

FAMILIAL TENDENCY IN ANGINA PECTORIS*

EDWARD S. MILLS, M.D.

Montreal

The interest in the following case lies chiefly in the history of angina pectoris running through four generations, and in the early onset of the disease. Of twenty-five members of the family known to the patient, eight suffered from anginal attacks and five died while in a seizure.

The patient, a tall slight male of sixty-four, a labourer, was admitted to the Montreal General Hospital on December 12, 1924, complaining of pain over the heart and down the left arm, numbness of the hands and feet, and headache, and with a dread of impending death. He first experienced twinges of præcordial pain when he was about fifteen years of age. These attacks were transient, recurring for one to two days then leaving him for several months, and never occasioning any worry. They usually followed excitement or great exertion. As he grew older, the attacks became more severe, the pain sharp and knifelike, shooting down the left arm to the hand, and up the back of the neck. The more severe paroxysms were accompanied by a sense of constriction in the chest, palpitation and some mental anguish. Ten years ago he first noticed shortness of breath on exertion and pounding of his heart until he had rested. In more recent years the attacks have been accompanied by substernal oppression, severe parietal headache, cold, white, numb hands, profuse perspiration and a feeling that, if he moved, he would die. These attacks have usually followed excitement or worry rather than physical strain.

Personal History: His personal history showed little of interest excepting a "rheumatic" attack three years ago of stiffness and swelling of the joints of the lower limbs. He was a heavy smoker and had one or two bouts of heavy drinking in a year. Born in Vermont, he came to Canada at the age of twenty-nine. He had diphtheria and measles as a child. He denied venereal disease, rheumatic fever and chorea, but admitted to "growing pains" as a boy. He has suffered from bleeding hæmorrhoids for years. One year ago he was again sick for three months with stiffness and swelling in the joints of legs and feet, which was called "rheumatism."

Family History: His maternal grandmother died suddenly in an anginal seizure. He did not know her age (forty to sixty). His mother had had many attacks and had died in one at age of sixty-eight. He had six brothers; one died in an accident; one died of blackwater fever; two died at age of forty-five and forty-seven respectively of angina pectoris. One is alive and well, and one is alive but suffers from angina. He had four sisters; two are alive and well; one died at twenty-eight in labour; one died at twenty-seven in an anginoid attack.

Patient had eleven children, two of whom died at birth. Remaining nine are all well except one girl of twenty-six who suffers from a mild form of angina.

The onset of the attacks in all instances occurred in the second or third decade. All members of the family affected have had the knifelike pain passing down the left arm. His mother and brothers, he knows experienced *angor animi*.

History of Present Illness: Patient was arrested in intoxicated condition on December 11, 1924, and arraigned the following morning. In the excitement he was stricken with the most severe and prolonged attack yet experienced. The pain and tightening in the chest were intense. He became dizzy, felt that he was going to die, and the next moment fell to the floor unconscious.

When seen about an hour after admission he was lying on his right side, afraid to move. There was no fear of imminent death but he had pain over the heart radiating down the left arm. The face had a pale grayish hue. The brow was covered with perspiration and the lips cyanosed. The hands and feet were blanched, cold, and numb. The pupils were pin point, equal, and reacted to light. All visible arteries were tortuous and thickened. The chest was of the emphysematous type; the lungs were clear. The heart showed enlargement to the left; the sounds were distant, muffled and toneless: a short systolic puff could be heard at the apex and at the aortic cartilage. No diastolic mur-

*From the medical service of Dr. C. P. Howard, Montreal General Hospital.

mur was heard; the pulmonic second sound was not accentuated. Blood pressure was S. 118; D. 64.

The abdomen was negative and reflexes were normal. The Wassermann was negative. All other laboratory findings were normal.

The patient was at once given nitroglycerin (gr. 1/100) and morphia (gr. 1/4) by hypodermic injection with prompt relief. The following morning he still felt weak but had no pain. The next day he insisted upon going home and walked out of the hospital.

Discussion: The chief interest in the accompanying case is in the remarkable family history volunteered by the patient. The diagnosis of true angina pectoris can hardly be questioned in his own case. The patient's fear of death was intensified by the knowledge that so many relatives had died under similar circumstances. Since none of these came under our observation nor under that of a physician from whom we could obtain reliable information as to the exact nature of the seizures, the diagnosis of angina pectoris in each case must necessarily be assumed. The fatal issue in so many instances, however, leaves little doubt on this point.

The unusual points in the family history are briefly these:

(*a*) The age of onset. In most instances the attacks began in the third decade, occasionally in the second. One sister died in a seizure at the age of twenty-seven and the daughter, a girl of twenty-six, was already a victim. This history is unusual though by no means singular. Allbutt[1] characterizing the disease as one of senescence or actual old age, states it is, even in its typical manifestations far from unknown in the young. In support of this he cites the case of a boy of twelve described by Herberden, to whom the disease owes its name. In his own series two cases were under twelve and a half years. He also quotes Stewart who reported typical seizures in a boy of seven. More recently Rutherford[2] has seen typical attacks during and following acute pericarditis, in a boy of six. He also refers to a few similar cases culled from the literature.

(*b*) Fatal seizures before the age of thirty are rare. Only one member of the family, the patient's sister, died before the end of the third decade, at the age of twenty-seven. In Osler's series of 268 deaths directly from the disease only four were under thirty years. In Mackenzie's[3] group of 284 not one was in the third or fourth decade.

(*c*) Such a group of cases suggests some common etiological factor. True angina always has an organic basis whether arteritis—luetic or infectious—aneurysm, or atheroma. The syphilitic basis can be discounted in this group in the absence of stigmata, and by the negative Wassermann in the case of our patient. The age of onset is against coronary atheroma although it is recognized that a precocious type may occur in early life usually associated with dwarfism or other abnormalities. The probable factor here is infection even if no history of it could be obtained from the patient. A great majority of the cases occurring among children are of this etiology, usually rheumatic fever.

(*d*) The influence of heredity. The history certainly points to a familial proclivity towards the disease through the maternal side as both the grandmother and mother of the patient died in an attack. This is of interest because the disease is said to follow the male side. In all four generations the females were affected though the mode of transmission to the fourth was through the father. Allbutt makes light of the idea of hereditary influences but admits that the disease may run in families, as first pointed out by R. Hamilton in 1780. Newburger found a history of angina in blood kindred in twenty out of his 143 collected cases.

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CASE OF LARVÆ OF FLY IN TYMPANUM

M. L. JEWETT, M.D., C.M., L.M.C.C.

Millville, N.B.

Case History.—Man, age twenty-six, complaining of five days' intense irritation in the right ear with bloody discharge and tinnitus.

Family History.—Negative. He had had his tonsils removed eight years ago, and no trouble since with ears or throat.

Examination with auriscope showed external auditory meatus to be partly filled with blood-stained serum, and a larva of a fly moving about the canal in close proximity to the tympanic membrane. This larva was removed by irrigation and on further examination a small opening

was found in the lower part of the membrane, through which another larva was seen moving backwards and forwards.

The larva removed from the external auditory meatus measured three-eighths of an inch in length. Irrigation failed to remove the second larva, but by instillation of two minims of chloroform in the opening of the membrana tympani the larva immediately withdrew from the tympanum into the external auditory meatus, and was then easily removed.

The patient made an uneventful recovery.

Phases of Child Welfare Work in Vienna.—Vienna is spending large sums of money in caring for children who cannot be given adequate care by relatives or who, for some reason, have to be admitted into institutions. For the purpose of centralizing control of all phases of child welfare, a unique institute has been created. The headquarters of the institute are in one of the most populous sections of the city. With respect to architectural design and construction, together with sanitary arrangements, the building incorporates many modern features. It contains: (1) a receiving home for children who are to be transferred elsewhere; (2) a pavilion, with a dispensary on the ground floor and a ward for infectious diseases on the second floor; (3) a dissecting room, and (4) nurses' quarters. Children who are referred to the institute by a social welfare worker, a welfare institute, the police department or various other organizations are classed as coming from "suspected sources," and are therefore given a medical examination as soon as admitted. If found to be in need of hospital treatment, they are sent to the adjacent children's hospital; otherwise they are turned over to the nurse in charge of baths. They are then quarantined in the children's home for from sixteen to twenty-one days. In the meantime, the clothing undergoes a thorough disinfection. The institute has accommodation for sixty infants with twelve nurses; forty-eight children under six years of age, and 108 children from six to fourteen years old, a total of 228 persons. All the wards are arranged according to the cubicle system, with five children in each cubicle. The cubicles are separated by glass partitions, and each cubicle has a separate kitchenette, its own bathroom and toilet, and its separate closets for soiled and fresh linen, so that in case of illness in one cubicle strict isolation is possible. There are also rest rooms, and adequate gas, water and electrical equipment. For children with serious illness there is a special ward containing eight entirely separate cubicles, each designed for two children. Then there are, in one large ward, twelve beds isolated by glass partitions, which affords a clear survey of the ward and makes control easy. There are three laboratories and a school dental clinic associated with the institute, although they have no organic connection. Much thought and care have been given to facilities for isolation of any department in the building. The many separate staircases make possible immediate exclusion of every group of cubicles and every room from all contact with the outside in case infectious disease suddenly develops. In the pathologic department there are pens for experimental animals, together with rooms for operations on animals and for the dissection of animals. A large playground for the children is likewise provided. After the period of quarantine, the children who are healthy but in need of welfare treatment are sent to a home for convalescents, to the main children's home or orphanage, to an institution in the rural sections, or to foster parents; or, if they are ill, they are sent to a children's hospital.

The advantages of this system are: (1) Money appropriated and contributed for philanthropic purposes is no longer partially squandered; (2) exact control of all children belonging to this class is possible; (3) more rapid distribution of the children is affected, and (4) medical control by reliable specialists takes the place of haphazard control of former days. The building necessitated about the the same expenditure of money as is usually figured ($1,300 per bed). The plans for the building were drawn up by a committee, with which leading pediatricians and hygienists were associated in an advisory capacity.

Retrospect

BACKACHE AND SCIATICA OF BONE AND JOINT ORIGIN

J. A. NUTTER, M.D.

Orthopædic Surgeon, Montreal General Hospital, Montreal

The following is a brief attempt to outline from the literature the present status of a subject which is of as great interest now as it was of slight repute not long ago.

Backache and flat feet have long been known to co-exist. Goldthwait's theory of sacro-iliac strain due to mechanical instability of the foot is well known. Dr. George Preiser, of Hamburg, somewhat later suggested that chronic back strain was gradually followed by an actual arthritis of mechanical origin (named by him static arthritis), and hence arose the backache. An interesting theory has been put forth by R. H. Paramore,[1] who suggests that both backache and flat feet are due to one cause, namely, generally poor musculature. This latter weakness he attributes to an impoverished blood supply, the result of lessened intra-abdominal pressure. The relief of the backache well known as the result of wearing a corset, is due, he says, simply to the general vascular improvement followed in turn by increase in muscle tone. His theory is ingenious and no doubt holds much of truth, but fails to explain the improvement in a backache where the flat feet alone are corrected.

Much of what is now being written deals with either sacro-iliac or lumbo-sacral strain, and their differential diagnosis plays a prominent part. There is a decided tendency to pay less and less attention to the former and much more to the latter, as a cause of backache. Pain or tenderness at or near the posterior superior spine has long been considered proof positive of sacro-iliac strain, but it is now being pointed out that many such cases have been probably strain of the lumbo-sacral joint, which lies between these two bony landmarks. It may be well to point out that sacro-iliac strain means simply a strain of this joint, and need show nothing in the x-rays. Its existence seems generally conceded, although the question whether the sacro-iliac joint is a strong or a weak one furnishes much debate with which we are not now concerned. Sacro-iliac relaxation, however, means an actual looseness of this articulation which should be demonstrable by an increase in its width as shown in the x-rays. Such appreciable increase in width is by no means often found, but when present is very definite evidence of relaxation of the joint. The third lesion of the sacro-iliac joint with which we are concerned is the so-called subluxation or displacement. This is still rarer, so rare that it is being denied existence save as the result of the most violent trauma, as following a railroad or automobile accident. Osgood[2] says: "In our opinion it is extremely unwise to make a diagnosis of displacement of the sacro-iliac joints without the most careful stereoscopic rœntgenological study. We believe they occur but are rare." He goes on to say that such a dislocation should be easily demonstrable by the x-rays if it exists.

One may fairly ask why such a diagnosis as sacro-iliac subluxation, for example, should play any part at all in the literature of backache if its very existence is denied. The answer is very simple. Certain types of backache and sciatica with signs pointing to the neighbourhood of the posterior iliac spines are susceptible of relief by manipulation. This is generally done under the complete relaxation afforded by an anæsthetic and is followed at times by a plaster of Paris spica. The rapidity of the relief in such cases has been suggestive of that following the reduction of a dislocation, and although the x-rays have been practically always negative, the location of the pain has made the diagnosis of sacro-iliac subluxation tempting though probably erroneous.

It may be added that Sir Robert Jones, when asked recently how such relief could follow manipulation of the spine under an anæsthetic, gave as his opinion that the improvement was due to the breaking down of adhesions, and that no subluxation existed anywhere.

W. R. MacAusland[3] says: "There has been much controversy in regard to the dislocation, relaxation and subluxation of the sacro-iliac joints. It is being recognized that sacro-iliac displacements have been over estimated. In my entire practice I have never been able to demonstrate by clinical examination or by x-rays the presence of a dislocation of the sacro-iliac joint,

except in cases of severe trauma, such as occurs in automobile or railroad accidents. Relaxation and subluxation of the sacro-iliac joints are infrequent, occurring only during pregnancy and they tighten up early after delivery. Many of the lesions supposedly of sacro-iliac origin are actually lumbo-sacral. In some cases an actual displacement forward of the fifth lumbar exists (spondylolisthesis)."

Osgood, while not denying the relief obtained in certain cases by manipulation, says: "We must find some other explanation than displacement (sacro-iliac or lumbo-sacral, etc.), when stereoscopic x-rays show no changes, before or after." He fairly sums up by saying that further anatomic study is necessary before we can explain the relief afforded in this interesting type of case.

Brackett in a recent discussion frankly admitted that the diagnosis between sacro-iliac and lumbo-sacral strain was one of the most difficult things he knew. However, the attempt is being made and one can understand why. Sacro-iliac strain is treated by a narrow belt affording compression to the pelvic bones, while lumbo-sacral strain needs broad and stiff antero-posterior support.

Key[4] says that sacro-iliac strain is only one-quarter as common as lumbo-sacral strain. Sacro-iliac strain is to be recognized because it causes pain even in bed and may at times show pain referred to the inner aspect of the upper thigh (obturator nerve) and to the pubes. The characteristic point of tenderness is below and lateral to the posterior inferior iliac spine (tenderness in the region of the posterior superior spine is *not* a sign of sacro-iliac strain. Lateral compression of the iliac bones, if painful, is a sure sign of sacro-iliac strain, but is not always present.

Key gives an interesting description of lumbo-sacral strain, dividing it into mild or postural cases and severe or traumatic cases, the latter often caused by heavy lifting. One finds the mild cases usually in women with a hollow back and bad posture (head forward and round shoulders). The pain is in the low back on both sides and is not generally referred down the leg. Tenderness is mesial to the posterior superior spines, and there is no limitation of motion in the lumbar spine. In severe lumbo-sacral strain, such as follows suddenly upon heavy lifting, the picture is one of a lumbar spine held rigid by muscular spasm and with the lumbar curve obliterated. Tenderness exists at the lumbo-sacral junction.

It is probable that most of these cases in the past have been wrongly diagnosed sacro-iliac strain, owing to the close proximity of the point of tenderness. When mesial to the posterior superior spine tenderness indicates lumbo-sacral strain, but when lateral to the posterior inferior spine it suggests a sacro-iliac lesion.

Smith-Peterson[5] says that there is no one diagnostic sign or symptom of sacro-iliac strain. He mentions that with such a condition the patient cannot rest easily in bed, while in lumbo-sacral strain he may rest in comfort. Sacro-iliac strain is apt to show typical sciatic pain referred along the distribution of the first and second sacral nerves, *i.e.*, the posterior aspect of the thigh and the antero-lateral aspect of the leg and the lateral aspect of the ankle, while lumbo-sacral strain is likely from the innervation of the joint to have pain referred to the distribution of the fifth lumbar and first sacral nerves, *i.e.*, the dorsum of the foot, all the toes, the whole of the sole and heel and the antero-lateral and posterior aspects of the leg. Tenderness of the inferior sacro-iliac ligaments and of the sacro-sciatic notch points to sacro-iliac strain, while tenderness on either side of the posterior part of the iliac crest is suggestive of lumbo-sacral trouble, as is also tenderness over the low lumbar and upper sacral spinous processes. In lumbo-sacral disease or strain this joint is fixed in all directions by spasm, while sacro-iliac cases, on the other hand, can bend the spine. A sacro-iliac case when seated, with the knees bent and the hamstrings relaxed, can bend forward freely, but when standing may show marked limitation of forward flexion owing to the hamstrings holding the pelvis fixed. A lumbo-sacral case will show no difference in spinal movement whether sitting or standing. Pain on compression of the iliac crests or on pressure over the pubes is suggestive of a sacro-iliac lesion.

In connection with the subject of differential diagnosis a very interesting clinical and anatomical study is presented by Danforth and Wilson[6]. Disregarding the theory of sciatica as a referred pain, which has long been accepted by writers on the subject, they search for the possibilities of actual pressure upon the roots of the sciatic nerve itself, namely, the last two lumbar and the upper three sacral. They point out that the fourth lumbar nerve has plenty of room in its intervertebral foramen and would

seem capable of being pressed upon or irritated only where it crosses the transverse process of the fifth lumbar, as for instance if this were greatly enlarged by congenital malformation (sacralization), fracture, etc. This nerve sometimes crosses the lowest part of the sacro-iliac joint, but the writers do not see how effusion or even relaxation here could cause pressure upon it. The nerve would be simply pushed away. The fifth lumbar nerve, however, seems much more vulnerable. In the first place it nearly fills its foramen of exit, and very little narrowing of this latter by congenital malformation or inflammatory exudate, etc., would undoubtedly cause pressure. Then again it crosses the intervertebral disc between the fifth lumbar vertebræ and the sacrum, which marks a joint subject to considerable movement, and where it is exposed to the irritation of spurs formed by chronic non-tuberculous arthritis. In two subjects the fifth lumbar nerve was found embedded in a canal formed by lipping at this articulation. In its course downwards it lies occasionally on the sacro-iliac joint. The sacral nerve roots lie well away from any possibility of direct contact with the sacro-iliac joint. The writers, therefore, conclude on anatomical grounds that the fifth lumbar nerve, of all the roots of the sciatic, is by far the most liable to direct irritation. They also point out that sacro-iliac strain or even relaxation would seem quite incapable of causing direct irritation of any of the roots of the sciatic, while the lumbo-sacral articulation appears on the other hand quite capable of irritating the fifth lumbar nerve root. Hence, they ague that lumbo-sacral lesions are to be given the credit for irritating the sciatic tract, rather than the now somewhat discredited sacro-iliac joint. It is only fair to state that those who uphold the theory of *referred* pain originating in lesions of the sacro-iliac joint as contrasted with direct irritation of nerve roots have by no means lost heart, and continue to bring forward arguments based largely on clinical findings. One argument put forth is as follows: Typical sciatic pain at the back of the thigh is in the distribution of the second sacral nerve root, which could hardly be directly irritated by any lesion of the lumbo-sacral joint, but may be referred from the sacro-iliac joint.

Brackett[7] points out that a back injury clears up very differently according to whether the back is a normal one or has been the subject of old arthritis or some congenital weakness of structure. Arthritis may have existed for years without revealing itself, until rough handling suddenly brings out unsuspected and perhaps intractable pain. Congenital vertebral anomalies generally occur at the lumbo-sacral junction, and remain hidden and unsuspected until pain or accident causes this region to yield up its secrets to the x-rays. Brackett classifies these as follows:

1. Impinging spinal processes brought on during the recovery from a flexed to an extended position of the lumbar spine.

2. Transverse processes elongated and impinging on the ilium have not been found of importance in industrial cases. Brackett does not attribute to these processes the importance they were once thought to have by causing pressure upon the nerve roots which cross them.

3. The articular processes at the lumbo-sacral joint may be congenitally weak and malformed. In this way the lumbar spine is insecurely poised on the top of the sacrum, and may be encouraged to slide forward and downwards (spondylolisthesis). If the lumbo-sacral angle is increased, which sometimes is the case, to nearly a right angle, security at this joint is lessened. There may be a congenital weakness (non-union, cartilaginous union) in the structure of the neural arch, to which the articular processes which give anchorage are attached, thus giving insecurity to the lumbo-sacral articulation which awaits only strain or blow to give way. In such cases abnormal strain is thrown on ligaments and pain ensues. Disability is out of all proportion to the severity of the accident, just as it is in cases of trauma with old arthritis, and in both recovery is long delayed or never comes. Brackett does not think occult *spina bifida* of much importance in connection with back pain.

While on the subject of congenital anomalies it is interesting to note what is written by Andre Leri[8] who points out that sacralization is very common in human and comparative anatomy, and in fact is the rule rather than the exception in x-rays of cases of backache. Many cases of ossification of the ilio-lumbar and lumbo-sacral ligaments being arthritic rather than congenital are mistaken for abnormal transverse processes and naturally are accompanied by pain. He advises against placing the blame for a backache on sacralization.

Osgood[9] says: "We believe that operations in cases of anatomical variations, especially the removal of transverse processes, are rarely re-

quired and are not without danger." He mentions impingements of the spinous processes in exaggerated lordosis as a cause of backache, also sacro-iliac relaxation as suggested by wide separation shown in the x-rays. He has been greatly impressed by the frequency of unsuspected colonic stasis and toxic intestinal absorption in cases of chronic arthritis. He recommends abdominal massage. He points out that following trauma an unsuspected arthritis is often the cause of persistent pain. Osgood emphasizes the point that very often a backache is due to two or more causes. For example, strain of a back may not yield to ordinary measures, and may be found to be complicated by uterine displacement or arthritis or anatomical variations, hitherto symptomless.

P. J. Verrall[10] points out that crush fractures of the spine follow comparatively slight injuries, especially in elderly subjects. An x-ray diagnosis is important as if undiagnosed and untreated deformity will gradually develop. Sir Robert Jones' method of mobilizing the spine under full anæsthesia following sprains and fractures is described. In this way adhesions are broken down.

The importance of sympathetic control of the back muscles is emphasized. The voluntary nerves control voluntary action, while the sympathetic fibres control mechanically the maintenance of posture. Thus, muscles have a double control (Sherrington and Bankart). Various causes are capable of upsetting the automatic postural control, such as neurasthenia, infections, eye strain, excessive mental effort, etc., thus throwing an extra burden on the voluntary muscles. As the latter weaken, the ligaments have to bear excessive strain and pain results

Mr. Verrall practises an operative fixation of the sacro-iliac joint by a tibial bone graft through both posterior superior spines of the ilium. The graft rests on a prepared bed in the sacrum under the erector spinal muscles. This method has been used with success in cases both of tuberculous diseases of the sacro-iliac joint and of metastatic arthritis.

Not much that is new has been written on the subject of non-tuberculous arthritis. Such a condition is probably responsible for a majority of cases of backache, especially in patients over the age of forty. Support of the spine, heat, massage, and a search for the cause still remain cardinal features in its treatment. Joint tuberculosis has not been included in this retrospect.

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An Outbreak of Typhoid in Vienna.—Owing to the excellent drinking water of Vienna, typhoid fever has become almost a thing of the past. It happens occasionally that sporadic cases are brought in, but through the action of the health authorities they are soon eliminated. This year, a large number of our citizens spent part of the summer in Italy and brought malaria and typhoid back with them. A short time ago, the death of a child and, soon afterward, the deaths of two adults were announced from a suburb of Vienna, the diagnosis having been "gastric fever." The necropsy findings, however, revealed typhoid, which shows that the medical attention was not quite what it should have been. As a partial excuse it may be said that typhoid has become so rare that many practitioners have ceased to think about it. In the outbreak mentioned, which thus far has been fatal in four out of about twenty-five cases, the necessary isolation measures were not taken at first, but that has been remedied and further progress of the disease seems unlikely. Typhoid about fifty years ago claimed more than 2,000 victims annually in Vienna, whereas now it causes a great sensation if two dozen persons contract it.

Editorial

HEALTH UNITS IN OUTLYING DISTRICTS

WE publish in this number an article by Dr. J. W. S. McCullough, calling the attention of the profession in Ontario, to the urgent desirability of establishing health units under the direction of full time qualified officers throughout all the outlying country districts in Ontario. Outside of our principal cities, which undoubtedly have a fairly satisfactory health administration, the health units in country districts throughout the Dominion are dependent almost entirely upon the service of practising physicians acting as part-time health officers and receiving only a small remuneration for the services they render. Such practising physicians acting as health officers are subject to the many disabilities necessitated by the calls of a general practice with all its attendant worries and anxieties, and feel the necessity of maintaining proper official relations with all their colleagues and competitors in practice—colleagues whose conformance to all the public health regulations these officers are supposed to supervise.

Dr. McCullough emphasizes the fact that in his opinion the only basis for an efficient local health administration is a well organized unit of well trained and duly qualified officers constantly on the job in an area of workable size, financially able to bear the cost of such an organization.

Very recently in England under a part-time health officer in a small Lancashire parish a severe milk-borne epidemic of paratyphoid occurred which occasioned severe public censure. Sir George Newman in his last report called attention to the lesson to be drawn from this deplorable occurrence and writes: "Notwithstanding all that may be said in praise of the whole-hearted efforts of many men to fulfil the double duty of public and private work, this system has outlived its usefulness and should be scrapped. Districts employing the whole time services of properly qualified men should be created in their place." Dr. McCullough also writes of the health service in Ontario: "There are of course notable instances where the local health officer despite the difficulties under which he labours has given a comparatively efficient service, but as a rule the administration in such part-time offices is poor, the funds for health work are scanty, and the personal direction of hygienic principles is neglected."

Another feature which increases the difficulties of our present sanitary administration is a defective notification of infectious cases by members of our profession who either fail altogether to notify the health authorities or delay their notifications so long as to render the necessary prompt isolation impossible. This very regrettable feature is not only frequently met with in Canada but also in England and calls forth remarks from Sir George Newman on the consequences that may follow such carelessness: "*Quis custodiet ipsos custodes?*" He emphasizes the necessity of every member of the profession assisting the health officers from whom is demanded a full time service and constant vigilance, not only to secure isolation of cases of contagious disease, but to prevent any possible conveyance of the disease germs to individuals who may be engaged in occupations which have to do with the production and distribution of food. In order to secure all possible efficiency in the carrying on of any public health service it is imperative that the co-operation of the profession as a whole should be secured, and it must be reaffirmed that the well-trained health officer will in no way interfere with the work of the family physician.

It has been found, however, both in

Great Britain and in the United States, that small towns and sparsely settled townships are unable for the most part to bear the necessary financial expense. Dr. McCullough recommends that several of these small districts should be combined to form one able to finance the installation of an efficient public health service with full time officers. J. A. Ferrell, in an article, "Health in relation to citizenship" (*Jour. Am. Med. Assoc.*, August 15th, 1925), urges the necessity for full time officers in the public health departments in rural communities, and insists that the cost of such service should be borne not only by the rural community but in part by the state and by the adjoining towns on an equitable basis. In support of this doctrine he enunciates the following principles: Public health is one of the most important of general community interests: community funds wisely used for health service will yield large returns. The scope of any health service in a community will vary with its special problems, its resources and its public conscience, but in all cases should include basic activities, and call for the employment of a well rounded unit of trained full-time men. While rural communities are seldom able to finance such a department, it should be remembered that urban communities are dependent in great measure on their outlying country districts for food, raw materials and markets, and should render assistance. A high standard of sanitation in any country develops a high type of citizen with a full measure of prosperity and happiness arising from an education in health matters and the inculcation of good health habits. Our profession should insist that every rural child in every country should have equal privileges with the city child, both in education and sanitation.

When a second conference on our National Medical Services meets we commend the problems connected with an improved sanitary organization throughout the rural districts of the Dominion to the attention of those in office as one of the most important subjects to be discussed.

THE WRITING OF MEDICAL HISTORIES

A MEDICAL history has many and great values. More than any other element, it helps to a proper understanding of the case, and is the best basis for both diagnosis and treatment, and so to the physician, at the time of writing is indispensable. Besides, a history is a permanent record to be read and re-read again and again; the patient's *vade mecum* throughout his treatment, and a contribution made to the sum of medical knowledge when he leaves the hospital. Histories are also material for research. Their study and analysis builds up medical science. In one thousand adequate histories, or even fewer, lie latent the possibilities of new masterpieces of medicine. And no better training for medical students has been devised than thorough-going history taking—and history making. Reading maketh a full man, it is true. and conference a ready man, but writing an exact man. The pen is mightier than the stethoscope.

A history, then, is worth eliciting and recording, and so should be done well. Being of value, and of permanence also, it should be according to the rules of the art, in good form and style, accurate, well-arranged, easy to refer to, neatly put down, well written. When it is finished, the writer—or should we not say, the author—should sign it, showing thus a proper pride in his product, and assuming responsibility also.

The whole investigation of the patient's condition is like that of a court trial, with the diagnosis as the verdict, after all evidence has been heard. The writer of a history is collecting evidence and examining a witness. He may constitute

himself for that purpose pretty much a whole court of law—judge, lawyer, detective, clerk and all the rest. He is not merely to take what is given him, but to hunt for what he needs, follow up every clue, sift the essential story out of a mass of fiction and irrelevant fact.

The patient, it must be remembered, has not had the training of a physician, and may be vague or wrong in his answers without intending to mislead. He may deny cough, yet on close observation admit a fairly frequent "hack," or a cough every morning on rising; will say he does not expectorate, but will admit that he clears his throat frequently, especially in the morning. He will explain that everybody does these things. On the other hand he may be sure he has had night sweats, whereas he has just occasionally had one blanket too many. Separate rigidly between fact, and the patient's fanciful explanation of fact, or even your own. Distinguish clearly between what he did have, what he says he had, and what he says Dr. X. said he had in that obscure illness twenty years ago. What patients say doctors said, would make even Hippocrates turn over in his grave. Mix judgment with the record. A history is not a stenographic report. A good history cannot be picked up on the surface. It must be dug for. You must use material the patient has given you, but it is your history, your product, your finished structure, not his.

Let the history be just as long as is needed to be complete. A short history is best if all the facts are suitably stated. Get all the significant data. Ask all relevant questions. Then edit your material. Sift and summarize before final writing. A disordered jumble of all the patient may have said is fit only for the waste-basket. Do not pad. Histories are not judged by weight, length or surface.

Some order in the presentation of a history is essential, a logical sequence in the development of the enquiry. Such an order may be suggested in print, but it should soon be transferred to the cerebrum and carried there. History sheets should be of plain paper. Printed forms with blank spaces to fill in perfunctorily are an abomination for physicians, and for students an abomination of desolation. No suggested or habitual order should be followed slavishly. All stories do not flow naturally in the same channel. Even a medical history can sometimes be made dramatic.

About some important matters, it is not enough that they be mentioned only when present; their absences should be noted. Histories to be of use in statistical study must record negatives as carefully as positives.

No idea can be more wrong than that the writing of histories is drudgery beneath the dignity of a full-fledged physician. A good physician differs from a poor one chiefly in this, that the former writes histories, while the latter does not. A diagnosis has often been missed by an experienced physician who does not write, and made easily by a man of much less experience who does write. A student can consider each opportunity to write a history a golden opportunity to push forward his study of the science and the art of medicine.

In *tuberculosis* the history must be a full one. If a man has a broken leg or a child has scarlet fever the history elements are few and easy to get. But the beginnings of tuberculosis are involved in almost all a man has ever been and done, in his parentage, associates, housing, work, play, habits, wages, temperament, nationality, social conditions and travels to and fro. It is a part of all that he has met. A generation ago family history was considered important because definite hereditary transmission of tuberculosis was believed in. It is important now, though hereditary transmission is not believed in, because family contacts are the earliest and most constant, and also, perhaps, because of inherited predispositions.

There is no more important part of the history than the record of previous illnesses. Acute respiratory diseases of all sorts, "colds," grippe, "flu," are easily confused with tuberculosis, or may very definitely open the door for it. A debilitating disease such as typhoid fever

doubles the chance of a tuberculosis breakdown in the next five years. Digestive disturbances and nervous conditions may be confused with, or be symptoms of, or may definitely lead to, the tuberculosis breakdown. Pulmonary diseases of all sorts—pneumonias, pleurisies, asthmas, spells of hoarseness—all must be canvassed and recorded.

In most diseases the time of infection and the time of onset of symptoms are separated by a brief and fairly constant interval; but in tuberculosis the interval may be a few days or two score years. This interval, long or short, must be reconstructed, filled in, charted, the events pieced together by careful enquiry, and the course of the disease thus traced. It is remarkable, once the diagnosis is made, how many old illnesses and debilities can be strung on the tuberculosis string.

General conditions, social, industrial, community and personal, have already been mentioned. A most important enquiry, even with diagnosis in view, is that with regard to work, amusement, recreation, rest, income and output of energy, and conservation or dissipation of strength. One of the chief causes of health breakdown is the overspending of energy, more usual in so-called play than in work, more usual in unnecessary than in necessary effort, more usual after six o'clock than before it. Many so-called recreations do not re-create, do not restore the balance after labour, but rather dissipate energy, until natural fatigue after labour becomes unnatural exhaustion after play. The social pace a woman sets herself, the amount of her non-essential activities, is a much more important element in her history than the amount of her proper housework or the diseases her grandparents died of.

A carefully taken, searching complete history, then, carries us farther toward an understanding of the case than almost any other means of investigation and at least half makes both diagnosis and prognosis.

D. A. STEWART

THE PROGRESS OF RADIOLOGY

TO the general practitioner the expansion of radiology into its highly specialized state, has been a little disconcerting in its rapidity. Not only so, but there has been so far comparatively little done to bring the subject under survey as a whole for those who leaning confidently as they do on the guidance of x-rays, are still desirous of occasionally taking stock of their own impressions and knowledge. We have had such a stock taking in the recent International Congress of Radiology in London, which even in the assumption of its title showed unexpected strength, for it was summoned first as a preliminary meeting, but the number of delegates in attendance, nearly 500, at once brought out the unanimous decision to call it the First International Congress of Radiology. Some impression of the ground covered may be gathered from the fact that the proceedings of the Congress took place in three sections: physics, electrotherapy and actinotherapy, and radiology, the latter being divided into two parts, one for discussion of radio-diagnosis and the other for treatment by radium and x-rays. There were 150 papers presented.

The President of the Congress, Mr. C. Thurston Holland, commented on the growth of the specialty dating from Rœntgen's discovery less than thirty years ago. In the early days a complete x-ray apparatus cost less than £30: nowadays an outfit to fully cover all branches would call for an outlay of about £3,000. He also called attention to the struggle which took place to establish the position of radiology as a means of diagnosis and of treatment, a struggle in which the pioneers had to contend with physical danger as well as technical difficulties. Not only injury but loss of life occurred amongst the earlier workers, but from these dangers

the modern worker was now secure. On the other hand, the joy connected with some of the original advances was something to remember; the thrill of discovering for the first time a stone in the kidney, or of seeing as something novel, the outline of the stomach under the opaque meal.

This spirit of rapid development was further dwelt on by Sir Berkeley Moynihan in an address* which ill bears anything less than complete reproduction. He pointed out, that a parallel might be drawn between the great advance in surgery wrought by the work of Lister and the magnitude of the assistance now given to the surgeon by the x-ray. "The change from those days, with the hesitation, the guesswork, the bitter and humiliating disappointments, to these days of confidence and precision is almost immeasurable, and it is to the devoted and skilful workers in the fields of radiology that we are grateful for the transformation."

Sir Berkeley in his lecture went on to show how in connection with abdominal diseases we (he spoke "in the rôle of a physician doomed to the practice of surgery!") had profited by the new methods of diagnosis and treatment afforded by radiology. In some conditions diagnosis depended altogether on the x-ray, diverticula of the pharynx for example, and cardiospasm. He recalled his first case of this nature, in which for some time there had been carried on much washing out of the stomach, as was thought. When at last this operation was repeated under control of the x-ray, it was seen that the tube had never entered the stomach but lay coiled up in an immense dilatation of the œsophagus. Diaphragmatic hernia also, though a rare condition, was perhaps impossible of recognition without the x-ray.

In gastric disease, it is hardly too much to say that we owe almost everything to the radiologist. Sir Berkeley commented keenly, and with a wealth of experience which only a few of the profession can claim, on the obscurities which may surround the diagnosis of gastric ulcer, but which have been so completely dispelled by radiology, and did not resist the temptation to preach the word in season as regards treatment of this condition. Many however will perhaps withhold judgment on his remark that "with the best will in the world he was unable to learn anything which satisfied his intelligence as to the worth of any method of medical treatment in cases of gastric ulcer."

In cancer of the stomach "the radiologist is now our strength. He is able to save time by making a diagnosis of filling defects, and by recognizing interrupted waves of motion, or a break in peristalsis on the affected curvature, or deflections in the current of the opaque meal, long before we could be in the least degree confident, by any other means at our command of the presence of a growth." The radiologist, also, is of assistance in diseases of the gall-bladder, and still more so owing to the recently developed method of examination introduced by Graham.

And yet radiology is still only an added weapon in the "clinical armoury"; it supplements but does not and cannot supplant our clinical resources. Occasional cases are met with in which the diagnosis made by clinical methods has been doubted or denied by the radiologist and yet has been confirmed by the subsequent operation.

In the matter of x-ray therapy the picture is a little less bright. There are complicating factors and not the least considerable of these is the fact that the radiological department receives such a large proportion of cases for which the surgeon can do nothing, as well as of those for which he has done all he can, "All the surgical outcasts find refuge here. . . Yet something is wrought upon these cases that at times approaches the miraculous." Sir Berkeley concluded by saying: "When we consider that this science is a newcomer into the fields of diagnosis, of therapy, and of research, the results obtained in so short a time are surely matters for which humanity at large may feel profoundly thankful."

H. E. MacDermot

*The Relationship of Radiology and Surgery: The Mackenzie Davidson Memorial Lecture, *Brit. Med. Jour.*, July 11, 1925.

XUM

ALCOHOL IN THERAPEUTICS

IN an interesting article on "Alcohol and the Circulation," the editor of the *Journal of the American Medical Association* writes as follows: "To say in the words of a recent writer on hygiene that alcohol has capitulated to an ideal of social responsibility may be more satisfying to the sociologist than to the physician. To call alcohol unreservedly a protoplasmic poison serves as a reminder that pure water and hydrochloric acid, both of which enter the human economy with occasional advantage, may also be assigned to the same category." To this we may also cite the much quoted *dictum* of an eminent clinician who held that whereas in health, alcohol is mostly a detriment, in disease it may sometimes prove to be a blessing. Little by little, however, the scientific truths about alcohol are coming into recognition through a broad-minded spirit of objective research. As the result of recent studies by McDowall of King's College,[1] London, it is asserted that owing to the influence of moderate doses of alcohol the skin capillaries become dilated so that the return of blood to the heart is diminished. This happens without any reduction in arterial pressure but is attended with a fall in venous pressure. The importance of this, McDowall avers, lies in the relief which a fall in venous pressure may give to an overtaxed heart.

In the same number an interesting article appears on, "The Use of Alcohol in Medical Practice," by Roger Irving Lee, of Harvard University, who writes: "Historically, alcohol has had its greatest vogue in therapeutics in the treatment of acute infections. The old accounts in the days of the vigorous therapeutics which preceded the present day of relative therapeutic nihilism, nowadays make weird reading. In the good old days of bleeding and purging the amount of alcohol prescribed was, indeed, colossal. Many older clinicians even to-day maintain the value of a moderate use of alcohol. With the better understanding of the processes of immunity it can hardly be claimed now that alcohol has any direct antagonistic action on pathogenic micro-organisms, or their products. It is well known that under special circumstances alcohol can be used as a food. My own views are that alcohol is of no real value as a food in acute infections, although I still withhold an opinion in regard to the possible beneficial rôle of alcohol in assisting the retention of needed fluids. Clinical, laboratory and experimental observations fail to disclose the value of alcohol as a stimulant as measured by any precise test or by any method capable of expressing actual measurement; but I hasten to add that a stimulating effect may not necessarily be expressed in terms of blood pressure readings, pulse rate, and the like. I, myself, have not been able to discover, clinically in acute infections, any stimulating effect in any particular or general sense of stimulation, from the use of alcohol. The patient, however, may feel better and be clinically better, although there may be no alteration in any available record. The single beneficial effect of alcohol in acute infections is, in my experience, psychological rather than somatic. I believe there is a definite field of usefulness for alcohol, amply substantiated by clinical experience, and as it happens amply substantiated pharmacologically. The usual immediate effect of alcohol on human beings is the creation of an artificial euphoria. All of us as physicians and as citizens have frequently witnessed this effect, and I believe that alcohol properly administered in selected cases in which a mild artificial euphoria is desirable is a valuable therapeutic procedure. It helps patients over a difficult period. An elderly patient, for example, convalescent from a respiratory affection, is conscious of many mild functional disturbances. He is depressed and miserable in mind and body. He is without appetite, and

(1) McDowall, R. I. S., The Action of Alcohol on the Circulation, *I. Pharmacology and Experimental Therapy*, xxv, 289, May, 1925.

has a sense of prostration and weakness. Of course, much can be done for this patient by careful nursing; nevertheless, the exhibition of alcohol in some agreeable form eases the miseries of his body, encourages him to eat, and helps in the establishment of recovery. There are also occasional cases in the early stage of pulmonary tuberculosis when the fever, the distress of body, and the consciousness of the existence of this dread malady make life appear very drab. The judicious administration of alcohol in small amounts alters this gloomy outlook on life, and may make endurable the rigors of the necessary regimen. The occasional cardiac patient with a large heart that no longer responds satisfactorily to digitalis and hovers between compensation and decompensation, often finds more comfort from alcohol judiciously given in moderate doses than from opiates which are better reserved for a future period. In the inevitable discomforts in old age as well as in the more sharply definite ailments of arteriosclerosis, alcohol occupies a high place in my regard. It does not, in the slightest, remedy the underlying condition. Its use is entirely directed against the symptoms of a sensation of ill being. If alcohol will enable the patient to eat more, to digest better, to sleep easier, not to mention the fact that it may give some freedom from bodily miseries, it would seem to have some definite benefit. Taking these facts together the result has been to convince me of the limited value of alcohol for one particular purpose, *viz.*, the creation of euphoria."

ON BIRTH CONTROL*

ON both sides of the Atlantic birth control has become the subject of much interest, and is discussed by politicians, social reformers, and religious leaders. A book advocating it has had an immense circulation, and has been followed by a book attacking it. Very recently a report has been issued by a special committee appointed by the National Council of Public Morals in England. The history of the enquiry goes back to 1913 when with official recognition this National Council of Public Morals established the National Birth-rate Commission. This commission had as president the Bishop of Winchester, and consisted of men and women in various walks including clergymen, physicians, and social workers. Among those who gave evidence before it were Lord Dawson of Penn, the Bishop of Guildford, Mr. Harold Cox, and Lady Barrett. The committee explained that it dealt solely with the ethics of birth control within the married state; and that a Christian outlook was assumed, which meant that life was lived with a background of Eternity; that the formation of character concerns our future as well as our present existence; that self gratification is not the true purpose of life, and that the family is a Divine institution. The committee thought that each couple should look forward to a family of four or five children at the least, but it expressed sympathy for persons in straightened circumstances who resort to contraceptive methods in fear of grave difficulties in bringing up a family of even moderate size. The report deprecated the exaggerated notion of some parents who assumed that a public school and a university education were necessary for every child. The committee recognized the serious drawbacks to parentage arising from the high cost of living and the inadequacy of housing. The main conclusions of the committee are stated as follows:

1. The comparatively modern practice of conception control, and in particular the artificial methods, call for fuller investigation from the medical, economic and religious standpoints.
2. The use of contraceptives is a

*Abstract from correspondent's letter in *Jour. Am. Med. Ass.*, August 1925.

symptom of the artificial character of our civilization whereby for large numbers a normal married life is difficult and in some cases all but impossible.

3. In numerous cases control of conception, apart from the question of the methods, is medically necessary and economically advisable, but all the circumstances should be weighed in the light of the best available scientific and ethical counsel.
4. While there are persons approaching the matter from the highest motives in whose judgment the use of contraceptives is justifiable, the practice opens the door to grave social perils, and a serious responsibility lies on married people who adopt it.
5. Our knowledge is not such as to justify either the advocacy or the condemnation of these means on the ground of alleged dangers of overpopulation; but within the British Empire the time is ripe for a campaign of empire-settlement and redistribution of population.
6. The weightiest argument for birth control is found in the economic circumstances (wages, inadequate housing and the like) of many.
7. The capacities for self-control, especially in young persons, are often underrated, and their training in this respect, as also in the ideals of married life, is a primary duty.

While on the subject of birth control it may be interesting to some of our readers to note the legal opinion given by Sir Travers Humphreys in answer to the question asked by the Council of the British Medical Association as to whether the operation for the sterilization of those who were mental defectives, either children or adults, performed by a surgeon for the purpose of preventing the procreation of degenerate or mentally abnormal offspring, would be legally admissible, Sir Travers Humphreys stated that he was of the opinion that any medical man who performed such an operation would, in the present state of law, be acting illegally and without any legal justification, except it could be shown that the operation was necessary to the health or well being of the patient. The legal risks, if such an operation were performed, would attach equally to all the persons concerned; that is, to the doctor, who performed it and to the parent or guardian who sanctioned it. An indictment for the offence of unlawfully wounding (Offences against the Person Act) might be taken against the surgeon, and an action for damages might be brought by the defective, through his or her next friend, in the same way as actions are now brought by infants. The only means at the present sanctioned by law for preventing the propagation of the unfit, consists in the segregation of such persons in licensed institutions. It may be added that at the meeting of Council at which the above opinion was read, Dr. Fothergill stated that Lord Riddell in a recent paper before the Medico-legal Society had put forward an opinion in some respects contrary to that expressed by Sir Travers Humphreys.

THE INFLUENCE OF PROLONGED SWIMMING IN FAVOURING INFECTIONS OF THE UPPER RESPIRATORY PASSAGES

IN an interesting paper (*Jour. Am. Med. Assoc.*, July 18th, 1925), Dr. H. Marshall Taylor calls attention to the fact that the literature dealing with infections of the upper respiratory passages induced by swimming has to a large extent ignored the fact that man has few structural adaptations to render him fit for a prolonged aquatic environment. Thus far any inflammatory reactions arising from swimming have in large measure been attributed to only one

etiological factor, that of contaminated water.

The experiences of others as well as his own aroused interest in the possibility of other factors coming into play, besides that of contaminated water, the most important of which is man's lack of adaptation to aquatic habits, and the question arose: "What is it that protects air breathing aquatic animals from sinus infection, while man is so liable to contract this when he places himself in their normal environment?" There is no essential difference in the epithelium lining of the respiratory tract of man and aquatic animals. The important difference would appear to lie in the fact that aquatic animals can at their will or involuntarily close the anterior nares and in this way protect the respiratory epithelium from the irritative action of water. Wiedersheim tells us that all diving animals are provided with a complicated musculature which closes the nostrils automatically whenever the head is submerged. Reese states that the posterior margin of the tongue of the alligator is elevated as a transverse fold which meets the corresponding fold from the lower side of the palate and completely shuts off the mouth from the opening of the trachea and gullet, and thus enables the animal to open its mouth under water without the water coming in contact with any part of the respiratory mucous membrane. Man has no such musculature. Analogous modifications exist in other aquatic animals. These adaptations are sufficient to prevent water from gaining entrance to the naso-pharynx and are far superior to any means possessed by man for keeping water out of the respiratory tract. Moreover, any lengthened stay of the human body in water of moderate temperature has a definite tendency to produce chilling of the body and thus lowering of the body resistance. The writer states that recently he became interested in the question of lowered resistance due to body chilling while in water, and particularly in reference to such chilling favouring the occurrence of sinusitis in children. To determine the facts he had the temperature taken of 250 children under thirteen years of age, both before and after they had been swimming for forty-five minutes in an indoor swimming pool with water at the temperature of seventy-three degrees Fahrenheit. Of the 250 children, only thirty maintained a normal temperature, while the other 220 showed a reduction of temperature, several to as low as ninety-five degrees Fahrenheit. Taylor sums up the result of his observations as follows: Nature has endowed aquatic animals with means for preventing water gaining entrance to the respiratory tract and for maintaining their body temperature for prolonged periods in cool water. Man is essentially a terrestial being, and his anatomy and physiology are not modified for a water environment. Caution should, therefore, always be employed. The following is the report of a committee of oto-rhinologists on the hygiene of swimming read in the section on laryngology, otology and rhinology at the last annual meeting of the American Medical Association in Atlantic City, May, 1925: "The healthfulness of swimming as an exercise is undeniable, but the human body lacks adaptation to sojourn in water, and means for its protection are, therefore, necessary. Public health authorities, in most of the states, have promulgated adequate rules for the construction, maintenance and bacteriologic examination of swimming pools and bathing places. In certain states, notices are now suggested or prescribed, 'warning persons with colds, head infections, running noses or ears or catarrh, that swimming or diving tends to force infection into the sinuses or ears, which may result in serious, if not fatal consequences.' The use of such notices should be suggested to the public health authorities of all the states. It is suggested that oiled wool or other effective methods of closing the external auditory meatus be advised, in order to prevent external otitis. It is further suggested that improper swimming or diving habits (such as inbreathing when the head is more or less submerged; diving feet first with nostrils open; blowing the nose, coughing or hawking into the tank)

should be forbidden by public health authorities. Research has disclosed rapid lowering of body temperature and hence of resistance to infection, both from immersion and from exposure of the body in wet bathing suits; it is therefore suggested that a time limit be placed on use of a pool by each bather in order that: (1) The number of bathers at any given time (bathing load) may be reduced. (2) The loss of body heat due to chilling may be minimized."

THE POST-GRADUATE COURSES OF THE FELLOWSHIP OF MEDICINE

WE desire to call the attention of our readers to the advertisement appearing in this issue with regard to the post-graduate work which has been arranged by the Fellowship of Medicine in London. Special courses have been outlined for October, November and December of this year, and there is a course for general practitioners to be held in the evenings of the first two weeks of November. It is possible to arrange to concentrate on one special subject for periods ranging from two weeks to one month, or, if desired, comprehensive tickets are issued for admission to the ordinary hospital practice.

The details of the work seem to have received considerable care, and those wishing to freshen their knowledge of medicine will find that they can take advantage of one of the largest hospital centres in the world, under the guidance of the leading men of Great Britain.

ERRATA

Please note that in our issue of August, 1925, p. 772, ten lines from the bottom of the first column, the word "first" should be "latter," and six lines from the bottom, the word "latter" should be "former."

Editoria Comments

CANADIAN MEDICAL PROTECTIVE ASSOCIATION

The annual report of the Canadian Medical Protective Association has been received and we note with pleasure that the total net assets of the Association amount now to over $28,000.00. The revenue from members' fees for the past year was $5,842.50, while the expenditure was only $3,996.32 of which $2,225.37 were required for legal expenses. There are over nineteen hundred members on the rolls.

The Association was affiliated with the Canadian Medical Association and will hereafter have a representative on the Council. We note the comment of its lawyer warning the Protective Association against assuming any responsibility in criminal actions. Such were never intended to be included in the scope of its work of defence and as there is no limit in such cases to the amount chargeable as legal fees, the Association might become involved in greater expense than the present very moderate fee would cover. For several past years the legal expenditures have been gradually increasing, an increase to be expected with the considerably larger membership. The protection afforded by the Association has been regarded as ample, but is not so complete as that granted by some insurance companies, who, it must be remembered, demand a much larger premium. There is no desire on the part of this Association to rival either the offers or high premiums of these companies. We believe that the majority of its members are satisfied with the service rendered by the Medical Protective Association which

gives ample protection against malicious lawsuits at a very moderate expense.

The Inter-State Post Graduate Assembly of America will meet this year in St. Paul, Minnesota, October 12th, 13th, 14th and 16th. The general headquarters for all scientific sessions and exhibits will be the Municipal Auditorium, by the courtesy of the St. Paul Association of Commerce, thus permitting the registration, the scientific meetings and the commercial exhibits all to be under one roof. The ampitheatre in this building has a seating capacity of 4,000. We observe on the programme among the list of speakers the names of Lord Dawson of Penn, and Sir Arbuthnot Lane, from England; Dr. E. W. Montgomery, of Winnipeg; Dr. Means, of Harvard University; Dr. George Draper, of New York; Dr. Chas. H. Mayo, of Rochester; Prof. J. C. Meakins; Dr. H. B. Cushing; Dr. Alfred T. Bazin, of Montreal; Prof. Duncan A. L. Graham, of Toronto; Dr. L. J. Austin, of Kingston; Dr. Hugh Cabot, of Ann Arbor and Dr. George W. Crile, of Cleveland.

In an article very interesting to Canadians, Dr. S. B. Woodward (*Boston Medical and Surgical Journal*, May 21, 1925), makes a comparison between the amount of smallpox in Canada and the various northern states of the Union. He combats the statement which he asserts has been made by health officers of the border states, that the presence of smallpox in their midst is due to its endemic presence in Canada. He quotes statistics showing that the number of smallpox cases in every border state exceeded the numbers in the several provinces in Canada and writes "The 37,845 cases of smallpox in Canada are 37,845 too many, (a statement with which all health officers in Canada will agree), but it is quite clear that there is less smallpox in Canada man for man than there is in the United States; that the provinces in Canada have more effectual laws regarding vaccination than exist in the majority of the States and that we are more a menace to Canada than Canada is to us." If the province of Ontario be ignored, one is obliged to look to Massachusetts and Rhode Island to find a lower percentage rate than that shown by our northern neighbours. Russia and India have more smallpox than do the States. China and Mexico may also have more but otherwise so far as Dr. Woodward knows, the number of smallpox cases occurring annually in the States is unsurpassed.

It is with much pleasure that we note the honour conferred at the annual meeting of the British Medical Association in Bath on two of the Canadian delegates, Dr. Alexander Primrose and Dr. F. N. G. Starr, by their election as vice-presidents of that Association. Both have been active in the executive of our own Canadian Association and have been untiring in their efforts towards its progress and advancement. In addition they have continued to take a lively interest in the British Medical Association as the parent association. These appointments are not only an acknowledgement of services rendered to organized medicine but a compliment to our own Canadian Association.

A "CANADIAN NUMBER" FROM AUSTRALIA

The "Canadian Number" of *The Medical Journal of Australia* reached us a short time ago, and proves to be in the main a collection of excellent articles contributed altogether by leading medical men in Toronto, headed by Dr. F. N. G. Starr. He it was apparently who in response to a request from our Australian colleagues, took the trouble not only to give a paper himself but approached others and obtained the various contributions.

The kindly spirit evinced by the production of this special number calls forth our warmest acknowledgements.

Our own *Journal* has for more than a year attempted to keep its readers in touch with all interesting and important developments in medical matters throughout the Empire, and the *Medical Journal of Australia* has always proved a valuable and authoritative source.

Another interesting fact is associated with this number, for we note that it was evolved as a result of messages brought over by Dr. N. D. Royle and the late John Irvine Hunter, on the occasion of their last visit to this continent. Dr. Hunter had already established friendships in Canada quite apart from the high place he had attained through his genius, and it is pleasant to find that the trip which, for him, was destined to end so tragically, should have been connected with the bringing forth of so gracious a gesture.

H. E. MacDermot

XUM

Abstracts from Current Literature

MEDICINE

Dreyer's Tubercle Antigen: Experiments showing the Failure of the Antigen to Protect Guinea-Pigs against Experimental Tuberculosis. Feinblatt, H. M., and Eggerth, A. H., *Arch. Int. Med.*, July, 1925, p. 121.

Dreyer's work was based on the assumption that if the waxy capsule of the tubercle bacillus could be destroyed the antigen could escape and the body set up an immunity reaction. He therefore, devised a method for removing the lipoidal substance from the bacillus. Other workers, for example, Kettle and Caulfield, experimenting with Dreyer's antigen, have shown discouraging results.

Feinblatt and Eggerth prepared antigen strictly in accord with Dreyer's technique and were able to verify the fact that Dreyer's process, namely, subjecting the organisms four times to formaldehyde action and acetone extraction renders the bacilli non-acid-fast. They began with a smaller dosage than Dreyer and earlier in the disease. The dose was gradually increased to that employed by Dreyer. Twenty-five guinea-pigs were inoculated with living tubercle bacilli. Twenty-one of these were treated with the antigen, four served as controls. In nine instances, vaccination was begun before the animals were inoculated.

All of the twenty-five animals died with post-mortem evidences of generalized tuberculosis, and there was no apparent difference in the course of the disease between the treated animals and the controls. There was a tendency for earlier glandular enlargement in the treated guinea-pig. Cessation of vaccine treatment in emaciated animals would often be followed by considerable gains in weight. Adenopathy appeared earlier in the vaccinated than the untreated animals.

The authors conclude that they have failed to adduce any evidence that this antigen protects guinea-pigs against tuberculosis, prolongs life, or in any way favourably influences the course of the disease. LILLIAN A. CHASE

The Prevention of Simple Goitre.—Hathaway, J. C., *Am. J. M. Sc.*, July, 1925.

The writer reviews the history and incidence of simple goitre, showing that every continent has a number of regions of endemic goitre and that there are besides many areas where the disease has a lesser prevalence.

He next discusses the ideas as to causation, coming to the conclusion that the disease must be due to iodine starvation. Iodine treatment has been used unwittingly by Chinese and Greeks long before the Christian era, and during recent years has become the recognized means of cure, but the prevention of the disease has not generally been taken seriously enough. Different methods are described, e.g., direct administration of sodium iodide, admixture with table salt, and diets including substances that contain iodine, but the author considers none of these as practicable as adding iodine to the water supply of the community. The amount necessary for effect has been determined by experimentation and he meets the arguments against this method in a very convincing way. The amount used would cause no taste, no poisoning, has had no effect on exophthalmic goitre, is much less expensive than any other system proposed, and finally would never exhaust the world's supply of iodine, which is enormous. Dr. Hathaway believes that the other methods of administering iodine should be kept for places where there is no water supply. P. M. MACDONNELL

Blood Transfusion. Its Dangers and Limited Value. Baldwin, J. F., *Am. Jour. of Med. Sc.*, July, 1925.

In view of the fact that there have been numerous fatalities associated with blood transfusion and many criticisms directed at its widespread use, Dr. Baldwin endeavours to obtain some general consensus of opinion, first of all by collecting statements made by a number of prominent scientists, and secondly by sending a questionnaire himself to a good number of surgeons and synopsizing their replies.

Both methods resulted in expressions of very similar opinions. Practically all these medical men agree that transfusion has been used too much and credited with many recoveries that would have taken place without it. There is strong support for the belief that in operative cases complicated by hæmorrhage the existence

of a very low hæmoglobin percentage does not account for death, but on the contrary patients will stand an operation well under such conditions as long as no other cause of death intervenes.

The almost unanimous opinion of these men, the writer finds, is that transfusion is useless and even dangerous in acute sepsis, doubtful in chronic sepsis or burns, and not altogether wise in pernicious anæmia. Its chief value is after acute hæmorrhage, before or after an operation for the cure of such cases, and of course in hæmorrhage of the new-born. P. M. MACDONNELL

Aseptic Meningitis in the Treatment of Dementia Præcox. Carroll, R. S. and others, *Am. Jour. of Psych.*, April, 1925.

Some years ago Lundvall of Sweden noticed that in some cases of dementia præcox improvement occurred during the course of infections (typhoid fever, tuberculosis, suppuration and other conditions) which produced leucocytosis, while other cases lost ground during periods of leucopenia. Recently Dr. James B. Ayer demonstrated that the injection of serum into the spinal canal of cats produces an acute exudative aseptic meningitis. It has also been proven by Dr. Lewis H. Weed and others that the spinal fluid is largely produced by the choroid plexus, and that this structure is rendered more permeable by meningeal irritation produced by the intraspinal injections of sera.

In consideration of the above, Dr. Carroll evolved the theory that "possibly an injured choroid interfered with normal chemotaxis, and perchance dementia præcox might prove a food-chemical deprivation rather than a toxic destructive process." A series of forty-nine cases of dementia præcox in the Philadelphia Hospital for Mental Diseases were treated by the removal of 20 mils. of spinal fluid and injection of the same quantity of normal horse serum in each case, and results carefully noted. The treatment was repeated in from seven to twenty-one days. A certain amount of nausea and febrile reaction followed each injection.

Summary of the forty-nine cases treated shows no improvement or only temporary improvement in fourteen cases, in six cases remissions occurred, and twenty-eight have shown marked improvement. Allowing for relapses, 66 per cent. of cases treated have received benefit which still continues after periods varying from two to eleven months.

The authors conclude that a fundamental principle is involved, the nature of which is not fully determined, and that further investigation may throw much light on the etiology of dementia præcox. A. G. MORPHY

SURGERY

An Analysis of Forty-one Cases of Thrombo-Angeitis Obliterans (with report of a case involving the coronaries and the aorta). Parla, David, *Surg. Gyn. Obst.*, July, 1925, Vol. 4, p. 21.

The author studied forty-one cases whose histories covered periods of two months to twenty years. In 10,000 cases of all kinds treated in the Montefiore Hospital, New York City, this disease occurred forty-one times, or 0.4 per cent.

There was no etiological factor determined. All but one were Russian, Polish or Roumanian Jews, but 95 per cent. of this hospital's admissions are Jews. Syphilis was excluded in all. The age of onset was from twenty to forty-five years; the greatest percentage was between twenty-five and thirty and the average age of onset of symptoms was 32.5 years. All were males.

Borchard in 1897 established its thrombotic nature, and Buerger (by whose name the disease often goes) described the arterial thrombosis, the recanalization of the thrombi in the peripheral arteries and veins, and differentiated it from arterio-sclerosis. The cases presented a symptomatology of three types: (a) early type, limited to the lower extremities without gangrene; (b) the chronic type with gangrene; (c) the chronic type involving the upper and lower extremities. Pain often preceded gangrene, even by as long as five years. It was at first intermittent with claudication in the calves, and at times, severe, burning, sharp, localized under the toes or at the seat of an ulcer. Nothing relieved it save morphine. The usual evidences of circulatory failure, numbness, tingling, cyanosis, ulceration, preceded the gangrene, which appeared from three weeks to fourteen years after the onset of symptoms, with an average of one to two years.

Physical examination otherwise showed normal conditions. *Diagnosis* often missed at first,

was readily made if usual signs were considered. Elevation of a somewhat bluish, cold lower extremity gives a quickly occurring blanching, which slowly disappears on lowering the limb. Usually palpable arteries can not be felt; systolic pressure in the affected limb is lower than on the other side. It is to be differentiated from arterio-sclerotic enarteritis obliterans, which usually occurs in patients over fifty with or without diabetes; from syphilitic endarteritis, the rare peri-arteritis nodosa with multiple small peripheral and visceral aneurisms; Raynaud's symmetrical peripheral gangrene, and acrocyanosis, with pulmonary osteo-arthropathy.

The average age of the limb after the onset of symptoms was one to two years. The author then reports clinically, with autopsy, a case of the so far unpublished condition of thromboangeitis obliterans of the aorta and the coronary arteries, and gives detailed case reports of the usual types of the disease.

Treatment is amputation as necessitated. Heat, diathermy, hypodermoclysis of Ringer's solution are only of temporary benefit; heat and rest being of most palliative value. The use of typhoid vaccine seems to be of some value, as also epidural injections of novocaine in saline as for sciatica. Surgical operations on the veins and arteries have failed in over 70 per cent. Ninety-one amputations were performed on the forty-one patients in the series.

The disease is probably of an infectious nature, as evidenced by the round-celled infiltration, the inflammatory reaction, the involvement of nerve fibres, etc. The disease is now being recognized frequently in large Canadian cities with their foreign Jewish populations.

CHAS. K. P. HENRY

Carcinoma of the Body of the Uterus. Davis, Lincoln. *Ann. Surg.*, July, 1925, p. 131.

The incidence of carcinoma of the uterus is one-third that of the cervix. It may be circumscribed or diffuse, but rarely involves the cervix. It is usually in papillary or polypoid form, tends to invade the myometrium, and affects the tubes and ovaries secondarily. Myomata were present in 21 per cent. of the cases studied in this report.

Classification is as follows:—(1) Malignant adenoma. A giant reproduction of uterine glands. (2) Papillary adeno-carcinoma. (3) Alveolar carcinoma. (3) Adeno-acanthoma in which squamous cells predominate over the glandular type.

The author quotes several authors who believe that "taken as a whole, cellular differentiation appears to be the most important factor" in grading the degree of malignancy. The results of his series do not justify the statement.

The chief symptoms are hæmorrhage and discharge, and colicky abdominal pains are common. Hæmorrhage, post-climacteric, means cancer nine times out of ten, and the author wishes to correct the impression that fibroids are a common cause of post-climacteric bleeding. In his experience they are not. Carcinoma before the menopause is more difficult to diagnose. A diagnostic curettage is always indicated, and contrary to all theory does not disseminate the disease if hysterectomy is performed immediately, or in a few days' time.

Abdominal hysterectomy is favoured in preference to vaginal. There are three important points to bear in mind. (1) Avoidance of tenacula on the fundus; (2) preliminary ligation of the distal ends of the tubes; (3) preliminary disinfection of the vagina, and closure of the cervix with gauze packing and suture.

The conclusions arrived at are that carcinoma of the fundus of the uterus provides exceptions to the theory of relation of cellular differentiation to malignancy; that it is a disease of slow progression, difficult to diagnose before the menopause, but quite obvious after; that diagnostic curettage is very necessary and does not disseminate the disease; and finally that myomata are frequently associated. R. V. B. SHIER

Primary Carcinoma of the Duodenum. Eusterman, Berkman, and Swan, *Ann. Surg.*, July, 1925, p. 153.

Carcinoma of the small intestine is not of frequent occurrence. The duodenum is affected less often than the jejunum or ileum. In the Mayo Clinic series 66 per cent. were in the ampullary or second portion, 22 per cent. in the supra-ampullary, and 12 per cent. in the infra-ampullary portion.

The symptoms vary with the location. If in the first portion, they are identical with those of pyloric obstruction. Involvement of the ampullary section produces symptoms of obstructive jaundice and simulates carcinoma of the

head of the pancreas. The jaundice is persistent but not so severe. When the third portion is involved the symptoms are those of high intestinal obstruction, with vomitus containing bile, and some observers have noted free HCl. The latter is of no diagnostic significance. The diagnosis is rarely made during life or before operation.

In seven of fifteen cases the initial symptom was severe pain of sudden onset, but in the remainder the initial symptom was that of reversed peristalsis moderate in character. Vomiting as a rule afforded relief, and two obtained relief with alkalies. Thus duodenal ulcer is simulated in a majority, but the rapidly progressive character, the onset in later adult life, and the general appearance of the patient point to a more serious condition.

A palpable tumour was present in 33.33 per cent. and only in cases involving the first and second portions. There was clinical evidence of obstruction in twelve cases, consisting of succussion-splash and visible gastric peristalsis. In five cases there was absence of free HCl. In the remainder it was present, and in all but one of these there was gastric retention. X-ray examination as a rule showed a dilated stomach with retention variable in amount, but without demonstrable lesion in the stomach.

The toxæmia of duodenal obstruction is that of an alkalosis with rise of blood urea, fall in plasma chlorides, and a rise in CO_2 combining power, and as the alkalosis increases, tetany. Alkalies are therefore contra-indicated. The treatment, therefore, is intravenous glucose and sodium chloride, and repeated gastric lavage. The blood chemistry of the patient must be corrected before operation is attempted. Gastro-enterostomy is the only palliative measure.

R. V. B. SHIER

PÆDIATRICS

The Van Den Bergh Test for Icterus in the Blood of Infants. Grulee, C. G., and Mebane, Annette A., *Am. J. Dis. Child.*, Aug., 1925, Vol. 30.

Van den Bergh's direct reaction is due to the type of bile which is present as the result of mechanical obstruction. The indirect reaction is found in cases in which no such mechanical obstruction exists. The bilirubin which gives the direct reaction is more easily oxidized into biliverdin than that which gives the indirect reaction.

Van den Burgh found that a direct reaction was obtained in all cases in which there was a mechanical obstructive jaundice whether light or severe. Most of the previous work has been on adults. Workers report findings similar to those of van den Bergh. Most investigators believe that the direct reaction indicates a hepatogenous origin of the bilirubin, while the indirect indicates an anhepatogenous origin. The technique is given in detail.

The cases observed are divided into five groups:

1.—Icterus neonatorum.
Twelve cases—action indirect.
2.—Icterus complicating acute respiratory infections.
Three cases—action indirect.
3.—Icterus resulting from destruction of liver cells following administration of neo-arsphenmine.
One case—action indirect, three times..
Child died; necropsy showed no obstruction of bile passages.
4.—Acute catarrhal jaundice.
One case—action indirect—twice.
Child died; necropsy showed acute catarrhal condition of gall-bladder.
2nd " acute catarrhal jaundice—indirect.
5.—Obstructive Jaundice.
One case—showed two direct reactions and three indirect reactions.
Child had acholic stools—discharged unimproved, diagnosis, suspected congenital obstruction of bile passages.

In the one case of obstructive jaundice the results were so irregular as to be of questionable value.

The authors conclude that the evidence here presented is such as to raise a doubt as to the value of the van den Bergh reaction as a method of differentiating between obstructive and non-obstructive types of jaundice in infants and young children.

LILLIAN A. CHASE

Tuberculosis in Children: A review of the mortality during the past quarter century in New York City. Drolet, G. J., *Am. Rev. Tuberc.*, 1925, June, xi, 292-302.

This paper brings out the fact that children are the greatest gainers from the anti-tuberculosis campaigns in the United States; and the fact is most strikingly illustrated in New York City. The last fifty years has seen a notable lowering in the death rate from tuberculosis among young children, which up till then was

"almost anywhere one of the highest at any period of life." In 1868, in New York City, 1191 infants died per 100,000 children under one year of age; in 1923, the corresponding rate was ninety-four per hundred thousand. Mr. Drolet points to such large gains as proof positive of the soundness of present day preventive work, but he thinks that instructive information is also to be gained by a detailed study of the mortality rates, especially since they are so readily available in the Bureau of Records of the New York City Department of Health.

In children under fifteen tuberculous meningitis causes half of the deaths. The death rate from this cause has been reduced in children in New York City from seventy-eight to seventeen per 100,000, or by 78 per cent., between 1898 and 1923. Pulmonary tuberculosis is the next important type in this group; the death rate from this has been reduced by 68 per cent. in the same period. The greatest decline, however, has been in the mortality from the abdominal type of tuberculosis. This was never a high rate in New York City, a fact which has been commented on, but it is none the less noteworthy to find that from the highest figure of eight per 100,000, it has in the last two years gone down to one. The measures adopted in New York City, calling for complete pasteurization of all milk except the certified, as well as the annual examination of large numbers of those handling food supplies, are held to be responsible for this reduction.

Further points brought out are:—(1) That there has been a greater decline in mortality amongst children than in adults. In the last quarter of a century the mortality rate from tuberculosis among adults has decreased by 35 per cent., whilst among children under fifteen there has been a corresponding decline of 60 per cent. (2) Infants, the most susceptible of all, show a reduction in the mortality rate during the last sixty years of 85 per cent. (3) It is believed that the majority of infants infected with the disease survive, and this in spite of the recognized seriousness of tuberculosis in infancy. (4) Among girls between ten and fifteen years of age tuberculosis is steadily a more frequent cause of death than among boys, indeed it is almost twice as great.

The prime factor in this reduction of mortality is held to be the segregation of advanced cases especially. The most noticeable lowering of the figures, as shown by the tables, coincided with two events particularly, first, the increasing of the number of beds for treating tuberculosis, and second, the general pasteurization of milk in the city.

H. E. MacDERMOT

Pemphigus Neonatorum. Memo. 103 / Med. H. M. Stationery Office.

Owing to the prevalence of this disease in English maternity homes this report is timely. Twenty-three babies were more or less affected, but none were fatal, no definite causal organism being made out.

The relation between pemphigus and contagious impetigo in infants is pointed out. Some slight skin lesion is the presumptive portal through the mother, nurse or infected clothing. A small pustule on a midwife's finger was suspicious, but in many cases no infective lesion could be found. The finger nails were the first site of the disease and the spread was rapid. Three mothers developed mastitis and two puerperal fever. A distinction is drawn between mild pemphigus lasting about a fortnight with little systemic disturbance and the severe type from an umbilical wound.

Owing to our imperfect knowledge of the method of spread of the disease, disinfection must necessarily cover a wide range.

C. R. BOURNE

Leprosy in New York City. Fordyce, John A., and Wise, Fred., *Arch. Dermat. and Syph.*, Jan., 1925.

Positive diagnosis is difficult to establish in leprosy, in certain cases, in spite of clinical history, biopsy and bacteriological examination. A series of forty-seven cases is reviewed. Clinical diagnosis of leprosy was made, without hesitation, and confirmed by observation, where laboratory corroboration proved futile. However, fresh skin lesions usually reveal clumps of acid-fast bacilli in the large oval mononuclear "lepra" cells. Smears are more fruitful from the nose than elsewhere.

The nodule of leprosy is an infective granuloma made up of cellular elements and giant cells which differ from those of tuberculosis in being vacuolated. The Wassermann reaction is positive in many non-luetic leprous patients A successful culture has not been made.

The theory of an intermediate host is untenable. Over a long period of observation in leprosy no case of contagion has been observed in the attendants. As isolated exceptions do occur, caution and isolation should be practised. The incubation period varies within wide limits from a few weeks to forty years, averaging five to eight years. As a result, leprosy may appear in any part of the world, but especially in seaports. Children are more susceptible than adults.

Excellent photographs are produced illustrating the early stages. Amongst these are such characteristic lesions as grouped nodules on face and forehead, forearms and hands; alopecia of the eyebrows, partial or whole; atrophy of the interossei muscles in maculoanæsthetic leprosy; ichthyosis-like condition of the legs; depigmentation in nerve leprosy; large concentric pigmented and depigmented target-like areas on the back and buttocks.

C. R. BOURNE

Effects of War Gases on the Lungs.—Usually the study of pathology is looked on as an aid primarily to the diagnosis, treatment and prognosis of disease. The widespread institution of workmen's compensation acts, and more recently the problem of care and compensation for soldier victims of the World War, have made new and often unanticipated demands for accurate information about pathologic conditions. An illustration of this is afforded by the questions arising in relation to the sick veterans who have been gassed. The immediate clinical effects and the acute lesions are already known; but it is not yet clear whether chronic disorders persist after the symptoms have subsided. Koontz, of the Edgewood Medical Research Division, has completed a study of the delayed effects to approximately lethal concentrations of phosgen, mustard gas, lewisite, chlorin, chlorpicrin and methyldichlorarsin in dogs, a species having lungs even more delicate than those of man. In the majority of the animals, pathologic lesions could not be demonstrated from two months to a year after recovery from the gassing. In a minority of instances, permanent lung damage was discovered; but it was not widespread, being confined generally to small areas, and usually in the form of small patches of organization, thickening of the bronchial walls with loss of elasticity, or occasional closing of the bronchioles by organized exudate. Such damage ultimately results in a small amount of fibrous scar tissue that can scarcely affect the functional efficiency of the lungs. Therefore Koontz believes it reasonable to conclude that in the vast majority of surviving human patients, who were not gassed so severely and who receive better hospital care all lesions disappear within a short time after the gassing. The small amount of fibrosis remaining in the minority of cases can hardly be a cause of serious disability.—*Jour. A. M. A.*, Sept. 19, 1925.

Dust and Pulmonary Disease. — Although mineral dust was thought to be a cause of pulmonary disease in the days of Paracelsus, scientific consideration did not assign it proper importance in this country until within the last ten years. In 1917 the Bureau of Mines issued a bulletin on silicosis in miners in the Joplin district of Missouri. More recently the Department of Labor has issued another bulletin with reference to the granite industry, and various other contributions have appeared elsewhere. Especially notable is the work of Movrogordato and Watkins-Pitchford at the South African Institute for Medical Research. The state department of labor in New York has just published a special bulletin on pneumonoconiosis which gives complete histories, examinations, temperature charts, roentgenograms and colored plates of the lungs in two cases of silicosis and one case of anthrosis with tuberculosis superinduced. This is an effort to stimulate study and to throw light on a health problem that affects chiefly workers in mines and certain mills. The millions of people in our large cities who constantly breathe air that is unnecessarily polluted with both gaseous and solid materials will find in it much to interest them.—*Jour. A. M. A.*, Sept. 19, 1925.

XUM

Medical Societies

ALBERTA MEDICAL ASSOCIATION

The annual meeting of the Alberta Medical Association was held on September 16th, 17th, and 18th in the ball-room of the Palliser Hotel, Calgary, under the presidency of Dr. William Hackney. From the point of view of excellence of addresses, lectures, and clinics, and of attendance, this was by far the most successful gathering since the inception of the Association in 1906.

The meeting was graced by the presence of Dr. Leonard G. Rowntree, Chief of the Department of Medicine at the Mayo Clinic, Rochester, Minnesota, and of Dr. F. A. C. Scrimger, V.C., lecturer in surgery at McGill University. The former addressed the members of the Association on "Diseases of the glands of internal secretion" and dealt fully not only with structural changes, but also with our present knowledge of the therapeutic values of glandular extracts. Dr. Rowntree also gave a clinic at the Holy Cross Hospital on different types of hypertension connected with cardio-renal vascular disease including the following:—The benign, the malignant, the type seen in nephrosis, the acute glomerular, the chronic glomerular. He emphasized the necessity of careful chemical examinations of the blood in the delineation of each variety.

Dr. F. A. C. Scrimger, V.C., read a paper of much interest to the physician as well as the surgeon on "Carcinoma of the Large Bowel." This careful study was based on the records of over eighty cases of carcinoma of the colon, of the sigmoid, and of the rectum, admitted to the Royal Victoria Hospital, Montreal, during the past three years. He dwelt especially on the necessity of early diagnosis, and of the difficulties encountered in determining this in numerous instances. He had much confidence in the value of the x-ray examination, though this may fail occasionally. A considerable number of patients had reached an inoperable stage when admitted to the hospital. The type of operation varied according to the location of the malignant growth and the stage this had attained. To obtain the best surgical results there must be an early diagnosis, and the continuous presence of visible blood in the stools of an elderly patient should always arouse suspicion in our minds of carcinoma. Diarrhœa with or without signs of obstruction is often present. Dr. Scrimger's remarks were timely considering the undoubted increase of carcinoma of the colon and rectum during the past decade.

Professor F. W. Mewburn, of the University of Alberta, gave an instructive lecture on "Infections of the Hand.' This had especial reference to the relationship of the palmar fascia, and of the thenar and hypothenar compartments of the hand to infective processes. A number of lantern slides were shown which demonstrated the paths along which purulent infections could travel in connection with the synovial bursæ. Cellulitis and teno-synovitis were differentiated and the best methods of surgical treatment were discussed and pointed out on an actual dissection of the human hand which showed certain features often difficult to elucidate.

Professor J. B. Collip, of the University of Alberta, spoke of "The new work on the parathyroid gland." This lecture summarized and embraced much of what has already been published in regard to the isolation of a hormone from this gland and the preparation of an extract of much potency for the treatment of tetany in the human being. The clinical application of this new remedy has in the past few months demonstrated its value not alone in tetany but in other disturbances where the calcium content of the blood was at fault. Professor Collip illustrated his lecure by many lantern slides which showed the large number of painstaking experiments performed and of records made before his epochal work on the parathyroid gland was given to the profession at large.

Dr. T. W. Walker, of Saskatoon, Saskatchewan, discussed fully in a well-prepared paper "Some of the more rare forms of anæmia," including acute lymphatic leukæmia, pernicious anæmia, and the aplastic form of anæmia.

Many contributions of a high degree of excellence were read, and in every case evoked discussion.

Professor L. C. Conn, of the University of Alberta, submitted a paper on "The use of the low cervical operations for cæsarean section."

Professor A. R. Munroe, of the University of Alberta, on "Cæcal stasis."

Dr. W. A. Lincoln, F.R.C.S. (Eng.), of Calgary, on "Acute suppurative appendicitis."

Dr. G. E. Swallow, of Edmonton, on "The premature child."

Dr. R. O. Callaghan, F.A.C.S., of Calgary, on "Plastic surgery."

Dr. M. E. Hall, of Edmonton, on "Development of intra-venous therapy in post-operative cases."

Dr. W. E. Spankie, of Calgary, on "The importance to the general practitioner of the accessory sinuses of the nose as sources of focal infections."

Dr. G. H. Malcolmson, of Edmonton, on x-ray treatments."

Dr. W. S. Quint, of Calgary, on "The radiological gall-bladder."

Dr. J. A. Blezard, of Edmonton, on "What anæsthesia records show."

Dr. F. W. Stockton, of Calgary, on "Some puzzling problems in children."

Dr. R. B. Hughes, of Calgary, on "Rheumatism."

Dr. J. S. McEachern, of Calgary, conducted a surgical clinic at the Holy Cross Hospital, in which cases of unusual clinical interest were demonstrated.

For the members of the Association and their wives, a delightful garden party was given at the home of Dr. and Mrs. Hackney. A banquet was tendered the visiting members at the Hudson's Bay dining room by the members of the Calgary Medical Society. Dr. E. R. Selby, D.S.O., the president of this body, took the part of toastmaster. Among the speakers were Mayor Webster, Dr. F. A. C. Scrimger, V.C., Dr. W. G. Anderson, City Solicitor L. W. Brockington, Dr. W. E. Spankie, Dr. Neil Macphatter, and others. A luncheon was given by the Kiwanis Club at the Palliser Hotel to the members, at which the speaker of the occasion was Dr. L. G. Rowntree, of the Mayo Clinic, who addressed the gathering on "Some recent advances in medicine." Dr. T. W. Walker, of Saskatoon, addressed the members of the Board of Trade on the subject, "Has the doctor justified his position in the community,"

At the annual meeting of the Alberta Association, the folowing officers were elected for the ensuing year:—President, Dr. I. R. Bell, Edmonton; First Vice-President, Dr. Oliver Boyd, Medicine Hat; Second Vice-President, Dr. Willis Merritt, Calgary; Secretary, Dr. W. A. Scanlon, Macleod Bldg., Edmonton; Associate Secretary, W. G. Hunt, Calgary; Treasurer, Dr. T. W. E. Henry, Fort Saskatchewan.

Members of Executive Committee retiring in 1926 are:—Dr. R. E. Buswell, High River; Dr. T. R. Ross, Drumheller; Dr. R. D. Robertson, Wetaskiwin; Dr. R. P. Borden, Daysland.

Members of the Executive Committee retiring 1927 are:—Dr. R. N. W. Shillington, Lethbridge; Dr. W. T. Hynes, Lacombe; Dr. F. D. Wilson, Calgary.

Representatives from College of Physicians and Surgeons are:—Dr. H. W. McGill, Calgary; Dr. A. E. Archer, Lamont.

The following were appointed as Alberta representatives on the Executive Committee of the Canadian Medical Association:—Dr. E. W. Allin, Edmonton; Dr. O. Boyd, Medicine Hat; Dr. E. L. Connor, Lethbridge; Dr. R. Parsons, Red Deer; Dr. G. R. Johnson, Calgary.

G. E. LEARMONTH

CAPE BRETON MEDICAL SOCIETY

A request having been received from the Cape Breton Medical Society by our Association to send two speakers to their meeting in Sydney on September 10th last, we are glad to report that Doctors Frederick Tees and I. M. Rabinowitch, of Montreal, were good enough to accept the invitations on behalf of the Association. Probably the success of the meeting may best be attested by abstracting the following from the report of the speakers:—

"We arrived in Sydney on the morning of September 10th, and were met at the station by Drs. Lynch and MacLeod. We were immediately taken to Dr. MacLeod's house whose guests we were for the time of our visit. Following breakfast we were taken to the place of meeting. Dr. Tees gave a clinic on fractures and Dr. Rabinowitch followed with one on diabetes. Luncheon was served at the hospital and was followed by an afternoon session at which Dr. Tees gave a further clinic on fractures and

Dr. Rabinowitch a clinic on nephritis. There was a very good attendance and all of the men took a very keen interest in the discussion. Afternoon tea was enjoyed at the home of Dr. and Mrs. Lynch. In the evening a very delightful banquet was tendered the visitors.

The Association learns with pleasure of this splendid meeting of the Cape Breton Medical Society at Sydney and further wishes to express its thanks to Doctors Tees and Rabinowitch for so worthily representing us on this occasion.

T. C. ROUTLEY

Miscellaneous

CRITICISM ON GYE AND BARNARD'S CANCER FINDINGS

Editorial, in *Journal of American Medical Association*, August 8, 1925.

The *Lancet* has now reached this country with the preliminary report of the new research. The scientific statements are preceded by this unusual editorial introduction:

> "The two communications which follow mark an event in the history of medicine. They form a detailed description of a prolonged and intensive research into the origin of malignant new growths, and they may present a solution of the central problem of cancer."

The *Lancet's* prejudgment of medical history is hardly in keeping with the modest claim that "they may present a solution," and gives the impression that someone may have become excited.... Striking as this contribution is, however, it has not served to establish that cancer is caused by a specific parasite, for numerous reasons which have seemed adequate to most investigators of cancer problems.... Dr. Gye has confirmed many of Rous' findings, and seems to have shown that the active agent in the growth is capable of multiplication in a special medium under anærobic conditions. He also has conducted some experiments which he interprets as indicating that the virus alone cannot produce the disease, but requires the presence of some other agent, probably a chemical substance, which is contained in the new growths. The virus is invisible by ordinary microscopic study, but by using the well known method of photography by ultra-violet rays (not a new discovery as the press accounts proclaimed), Mr. Barnard has demonstrated the presence of spheroidal forms which are believed to be the infective agent, but, as far as we can see, without any proof that this is the case. As Barnard himself says: "Unless considerable care is exercised, the spheroids may easily be confused with other spheroidal bodies occurring in most organic fluids."..... Certainly, this is far from the discovery of the specific germ of cancer. Gye's own conclusions are expressed in the following words:

> These researches have led me to look upon cancer —using the term in its widest sense—as a specific disease caused by a virus (or group of viruses). Under experimental conditions the virus alone is ineffective; a second specific factor, obtained from tumour extracts, ruptures the cell defenses and enables the virus to infect. Under natural conditions, continued "irritation" of tissues sets up a state under which infection can occur. The connection between the specific factor of a tumour and an irritant remains to be investigated....

The critical reader of the reports in the *Lancet* obtains the impression that an intricate hypothesis has been developed on a small number of facts, and that if on reinvestigation by others new facts should be discovered, the hypothesis will collapse.... It will require much more proof and repeated corroboration of these observations before it will be demonstrated that all cancer is caused by a "cancer germ," either with or without some chemical accessory agent.

In an article in No. 32 of the *Deutsche medicinische Wochenschrift*, Professor Blumenthal, director of the Berlin Institute for Cancer Research, gives a series of critical observations on the results of Gye's cancer research, which appeared in the *Lancet*, July 18, 1925 "Gye concludes from his experiments that he has found and demonstrated the cancer parasite in the form of an invisible virus. He admits, however, that he has not as yet adduced any positive proof for this conclusion. Before the evidence can be regarded as convincing, it will be necessary not only to propagate the parasite but also to prepare a culture of it, and, through inoculation from a definite portion of the culture, to secure further cultures with which tumours are produced. He thinks it is possible that there is not only one invisible virus but that there are several viruses

corresponding to the various kinds of cancer. The substance that is derived from the animal itself and which is present in each tumour is specific in that it is the decisive factor not only for the particular species of animal but also for the variety of tumour; that is to say, that a filtrate from a sarcoma can make it possible for the parasite to produce only a sarcoma, while a filtrate from a carcinoma will give rise to only a carcinoma. The same would be true of the species of animal.

The significance of the results of Gye's cancer researches for the etiology of cancer is possibly impaired somewhat by the fact that the so-called chicken sarcomas are regarded by most pathologists as different from the sarcoma occurring in man and as being merely infectious granulomas. In any event, of all animal tumours they are, biologically, the farthest removed from human cancer. As evidence for the asserted regular occurrence of the Rous virus in the cancer tumours, a number of interesting illustrations are furnished which we owe to Barnard's discovery of a *new optical instrument*...." Blumenthal further states that he is convinced that the reported results of Gye's researches are of paramount importance for the rôle of a virus or of a group of viruses in the pathology of tumours, though he does not believe that all the conclusions drawn are justified.... That the study of the problem of invisible viruses has received new impetus through the researches of Dr. Gye and Mr. J. E. Barnard cannot be questioned. It is quite within the range of the results of previous researches on malignant animal tumours to endeavour to explain the tumour-producing qualities of not only animal but also vegetable parasites recognized as causative agents in cancer, by the assumption of such a virus.... The demonstration, for the first time, of cancer-producing parasites in human cancer and their cultivation in pure culture by Auler, Paula Meyer and myself is a piece of experimental evidence which investigators of the parasitic origin of cancer in man should not pass over in silence. It would, of course, mark a still further advance if their cancerogenic properties could be shown to be uniformly due to a definite virus or a group of viruses. While Gye and Barnard have not yet succeeded in making this demonstration, their researches constitute an important step in that direction. Gye's demonstration of the significance of a second factor in the production of tumours is also in accord with our experiences in experiments with our neoplastic bacilli, according to which, besides diatomaceous earth, the addition of lymph from a cancerous organism was needed to produce transplantable malignant tumours.... The purely experimental results of Gye are entirely in harmony with the findings reached in other ways. Not only the methodology but also the actual accomplishments constitute an important advance in the knowledge of the genesis of tumours. Although—in Blumenthal's opinion, at least—the researches of Gye have not as yet furnished us with an unequivocal solution of the problem of the origin of cancer, we can feel assured that the new methods and the facts thereby established will give a fruitful stimulus to future research. (Berlin Correspondence; *Jour. Am. Med. Assoc.*, August 22, 1925).

Obituaries

Dr. Samuel J. Kirk died suddenly at his home in Macleod, Alberta, in August, 1925. Dr. Kirk was born at Kirkton, Ontario, in 1870. After teaching in Ontario for a number of years, he came west, and studied medicine at the University of Manitoba. He practised at Oak River, Manitoba, Edmonton, and Tofield, Alta., coming to Macleod in 1917. He was medical health officer for Macleod for several years. P. M. CAMPBELL

Dr. John Leeming Walker, of Montreal, surgeon on the *Orca R.M.S.P.*, died suddenly of cerebral hæmorrhage an hour before the liner sailed from New York on August 15th. Born fifty-seven years ago, the son of the late W. H. Walker, at one time general auditor of the Grand Trunk Railway, he graduated in medicine in 1891. While at McGill he was one of the foremost athletes; in addition he was a member of the Victoria Rifles. When war started he left New York and went overseas with the Canadian Hospital Unit.

XUM

Medical News from the British Empire

IRELAND

The question of medical registration in the Irish Free State has been raised, and a very decided stand on the matter has been taken by its Legislature. Mr. Cosgrave, President of the Executive Council of the Free State, is reported to have said recently, "That an important profession within the State should have its centre of gravity and disciplinary headquarters in the capital of another country is felt to be so incompatible with our constitutional status that we must be prepared to face whatever minor and temporary disadvantages may accrue from the cessation of that arrangement"; and later on the Minister for Justice said to a representative committee, "We must have a separate register and, if not that, the Government might, as a last resort, allow you to go on the Colonial Register, but certainly you shall not stay on the General Register. I know that the profession will suffer; that is, in its schools it will lose students, but you must be satisfied to suffer something for the sake of the status and dignity of our country."

The *British Medical Journal* (August 22, 1925) remarks that the situation is somewhat confused at present, but that the opinion of the medical profession in the Free State on the matter has not yet been fully ascertained. "The proposal of the Government is, we are informed, condemned by newspapers of all shades of opinion in the Free State. It is being criticized in a very adverse sense by medical teachers in Dublin."

News Items

NOVA SCOTIA

Dr. J. M. Stewart has removed from Halifax to Upper Stewiacke.

Major J. A. Murray, R.C.A.M.C., has gone to England to spend a year at special work in R.A.M.C. centres.

Dr. Clement MacLeod, of Halifax, recently sailed for a course of graduate study in the eye, ear, nose and throat at Vienna.

Dr. Reginald Morse, medical missionary, has been spending a furlough at his old home in Nova Scotia, and is to return shortly to resume his work in China.

In the course of a recent visit to Halifax, Dr. R. E. Wodehouse, Secretary of the Canadian Tuberculosis Association, delivered much appreciated addresses before the Rotary and Commercial Clubs of Halifax and the Halifax Anti-tuberculosis League.

Dr. John Stewart, representing Dalhousie University, and Drs. J. G. MacDougall and E. V. Hogan, representing the Provincial Medical Board, attended the recent meeting of the Medical Council of Canada, at Ottawa, at which Dr. Stewart presided.

On the 27th of August the citizens of Upper Stewiacke and neighbouring country turned out en masse to celebrate the completion of fifty years of practice in that community by Dr. Robinson Cox. Dr. Cox is with but one exception (Dr. Finlay MacMillan, of Sheet Harbour) the oldest living medical graduate of Dalhousie University and the senate of the university sent a communication to be read at the celebration in which appreciative reference was made to the splendid manner in which Dr. Cox has exemplified the finest ideals of service to the community. The Medical Society of Nova Scotia was represented by Dr. S. L. Walker, Associate Secretary, who delivered an appreciative address and conferred upon Dr. Cox honorary membership in the Society. A neatly bound address, signed by nearly four hundred of his fellow citizens, was also presented to the worthy doctor, together with a beautiful loving cup, while a fine pair of silver candle sticks was presented to Mrs. Cox. It is understood that the Colchester-Hants branch of the Medical Society of Nova Scotia will, at its next meeting, fittingly demonstrate the affection and esteem in which Dr. Cox is held by his professional associates.

An important conference, for the discussion of the possibilities for co-operative effort by the three maritime provinces in combating tuberculosis, was held at the Nova Scotia Sanatorium, Kentville, on the 22nd of July. The Hon. Dr. Rehfuss, of Bridgewater, represented the government of Nova Scotia and presided over the conference. Among others in attendance were Dr. R. E. Wodehouse, Secretary of the Canadian Tuberculosis Association, Dr. A. G. Nicholls, of the National Research Council; Drs. George E. Melvin and Wherret, of the New Brunswick Department of Health; Dr. H. A. Farris, of the St. John County Tuberculosis Hospital; Dr. Collins, of the River Glade (N.B.) Sanatorium; Drs. Jost and Chisholm, of the Nova Scotia Department of Health, and Dr. Sieniewicz, of the Massachusetts Halifax Health Commission. Dr. Miller, the Superintendent of the Nova Scotia Sanatorium, was unfortunately unable to attend on account of illness, but was represented by Dr. Bayne and others of his staff. The day was spent in careful consideration of the various problems of the three provinces. Resolutions were passed favouring renewal of efforts at popular education in respect of tuberculosis, the investigation of the relation of bovine to human tuberculosis, tuberculin testing of cows, proper supervision of the production and marketing of milk supplemented with pasteurization if conditions are not quite satisfactory.

The corner stone of the new building for St. Martha's Hospital, Antigonish, was laid with appropriate ceremonies by His Lordship the Bishop of Antigonish on the 29th of August. Many prominent persons were present, including a large representation of the medical profession. Among those who made address was Dr. M. T. MacEachern, Associate iDrector of the American College of Surgeons, who paid a fine tribute to the work of St. Martha's Hospital in the past. The new building, which is to cost upwards

of $300,000.00, has been designed by competent hospital architects, and is well advanced towards completion. It is expected that it will be ready for occupation early in the new year.

The third annual meeting of the Maritime Conference of the Catholic Hospitals Association was held in Halifax during the first three days of September, and was largely attended. A very comprehensive and helpful programme was carried through. On the afternoon of the first day, this conference met jointly with the Hospital Conference of the American College of Surgeons.

The Maritime Section of the American College of Surgeons met at Halifax on the first and second of September, under the chairmanship of Dr. George H. Murphy. There was an excellent attendance of the fellows resident in the maritime provinces, and also of practitioners to whom the general meetings were thrown open. Drs. Wm. Frances Campbell, of Brooklyn; James T. Case, of Battle Creek, and Gordon New, of Rochester, Minn.; Rev. Fr. Gareschi, of Baltimore, and the associate directors of the college, Drs. M. T. MacEachern and Allan Craig, took an active part in the proceedings. The mornings were given over to clinics at the Victoria General Hospital, while the afternoon sessions were held at the Medical Sciences Building of Dalhousie University. On the evening of the first day a community health meeting was held in the auditorium of the School for the Blind, which was filled to capacity. At this meeting, after official welcomes by the Premier and the Mayor, and introductory remarks by Dr. Murphy, very practical addresses were delivered by Drs. MacEachern, Case, Campbell and Craig, and Rev. Fr. Gareschi. A round table conference on hospital problems was conducted by Dr. MacEachern and proved to be most profitable. The arrangement of the programme was admirable, and a very successful meeting was brought to a close by an enjoyable evening at the Waegwaltic Club.

The Dalhousie Post-graduate Course merged its sessions for the first two days with the Maritime Section of the American College of Surgeons. The balance of the course was conducted according to the usual plan, the mornings being given almost entirely to clinics and the afternoons to lectures. The attendance was very gratifying, many physicians from without Halifax and its environs having registered. The Dalhousie Faculty had the assistance of Dr. James T. Case, of Battle Creek; Drs. Luther MacKenzie and Ross Faulkner, of New York; Dr. J. Meakins, of Montreal; Dr. Farris, of St. John, and Dr. C. M. Bayne of Kentville. Members of the Dalhousie Faculty who took part included Drs. Silver, Hogan, H. K. MacDonald, Nicholls, Cameron, Young, Babkin, K. A. MacKenzie, Weatherbe, MacDougall, MacLellan, Murphy, Atlee, D. J. MacKenzie, Mathers, Lessel, Carney, Mach, Curry, P. A. MacDonald, Muir, Sieniewicz, Eager, Johnston, Cunningham and Doull. In the presentation of the work, the effort was made to consider the practical needs of the general practitioner, and those who took the course spoke enthusiastically of its quality and usefulness.

W. H. HATTIE

QUEBEC

The establishment of a psychopathic hospital for the treatment of nervous disorders and certain types of mild nervous breakdown, was recommended by Dr. C. F. Martin, dean of the Faculty of Medicine of McGill University, recently, and the matter is also under the consideration of the Mental Hygiene Committee of which Dr. Martin is an honorary advisor. In outlining his plan, Dr. Martin said: "The ideal thing is to have a psychopathic institute directly in association with the medical wards of a general hospital, or to have a wing or ward of an existing general hospital given over to the special purpose." The problem of treating psychopathic cases is an extremely difficult one owing to the lack of proper facilities. There are many people now in insane asylums who should not be there, but so far there is no alternative to placing them in institutions in company with persons suffering from definite mental disorder. There are also many patients in hospital wards who should properly be transferred to a psychopathic ward in the same hospital, were such in existence. By this means these patients would be assured the necessary specialized treatment and pressure on the other wards would be relieved."

The Ste. Agathe Sanatorium, closed since December, 1923, opened its doors September 1st, to admit three patients. It is expected that ten patients a day will be admitted until the capacity of 210 beds, is reached. Considerable repairs have been completed under the direction of the provincial government which undertook to bear the cost of this work. It is estimated that this repair work has cost over $100,000, but the institution is now fully completed. From now on the sanatorium will be operated by the Laurentian Sanatorium Association, Incorporated, which body was incorporated for this purpose, as the Royal Edward Institute does not provide for such work. The majority of the directors are, however, also directors of the Royal Edward Institute. Application for admission to the sanatorium should be made at the admitting office, No. 47 Belmont Park.

Dr. S. Boucher, city health director, has gone to Ontario to tour the farms of that province with a view to comparing notes and picking up any information that may be useful in improving the farms of this province from the sanitary point of view. He is accompanied by Dr. A. J. G. Hood of the City Health Department. They will give special attention to the handling of milk at these farms in view of the coming into force next May of the pasteurization by-law. Dr. Boucher made a tour of the districts around Montreal recently, and found the farmers getting ready to give whole-hearted co-operation in the application of the milk by-law. He has also visited a number of private abattoirs in the districts around the city, and is obtaining their co-operation in regard to the by-law which is now before the City Council to forbid the sale of meat in the city which does not bear the stamp of official approval.

Dr. N. Lacerte, one of the oldest medical men in the district of Quebec, was the central figure in a demonstration staged recently by a group of citizens of Levis. The demonstration took the form of a banquet held in Levis to mark the sixty-second anniversary of his entry to the practice of medicine. A large number of Quebec medical men assisted in the celebration in honour of their colleague of the South Shore. After receiving the congratulations of his friends, Dr. Lacerte, who is eighty-five years old, delegated his son the task of thanking his friends and colleagues for their testimony of esteem.

GEORGE HALL

XUM

MANITOBA

Dr. J. D. McEachern and Dr. L. N. Pickard have returned from post graduate work overseas.

Dr. Bruce Chown, a son of Dr. H. H. Chown, former Dean of the Medical Faculty, University of Manitoba, has returned to Winnipeg after several years post graduate work in New York, Baltimore, and Boston, and has opened an office in the Medical Arts Building. He will limit his practice to pædiatrics.

The medical staff of St. Boniface Hospital has been reorganized.

Dr. C. J. Meredith, who has been working in northern Manitoba under the Red Cross, is leaving shortly for Great Falls, Montana, where he will practice.

Dr. A. N. MacLeod, Secretary of the Medical Faculty has disposed of his practice in Stonewall to Dr. Donovan, late of Selkirk, and will reside in Winnipeg.

Drs. E. W. Montgomery, Wm. Chestnut, John McEachern and Prof. A. T. Cameron recently visited Morden, Carman, Miami, Ninette and Holland in connection with the enquiry into cases of pernicious anæmia.

Dr. John McEachern is opening an office in the Medical Arts Building.

Dr. John McDougall has returned from MacGregor and will resume practice in Winnipeg.

Dr. W. J. Herringer has opened an office in the Boyd Building. His practice will be limited to eye, ear, nose and throat.

The annual meeting of the Manitoba Medical Association on September 22, 23, 24, was a decided success. All the meetings were held at the Fort Garry Hotel and in consequence there was little time lost. The visiting speakers were Dr. F. A. C. Scrimger, V.C., of Montreal; Dr. Thos. Walker, of Saskatoon; Dr. L. G. Rowntree, of the Mayo Clinic, Rochester, Minn., and Dr. Rood Taylor, of Minneapolis. Local speakers included Drs. Jas. McKenty and O. Bjornson. Clinics which occupied a half day of the programme were arranged by Drs. E. W. Montgomery and Chas. Hunter. A golf tournament at the Winnipeg Golf Club was arranged by Dr. G. W. Fletcher.

ROSS MITCHELL

ALBERTA

Dr. F. F. Law, a recent graduate of Alberta University, is now practising at Tofield.

Dr. C. S. Maclean, of Bentley, has retired from practice and is devoting himself to horticulture.

Dr. W. H. S. Scott, of Carrot Creek, has moved to Altario.

Dr. J. E. Jackson recently removed from Ontario to Donalda, where he is now practising.

Dr. G. A, Byers has moved from Nebraska to Rimbey, Alberta, where he will be associated with his brother, Dr. S. J. Byers.

The Council of the College of Physicians and Surgeons has again agreed to grant five prizes of the value of fifty dollars each to medical students of the University of Alberta who rank (1) first in general proficiency in the first year subjects; (2) first in physiology; (3) or in anatomy of the third year; and (4) first in medicine or in surgery of the final year.

The Council of the College of Physicians and Surgeons of Alberta has made arrangements with the University of Alberta whereby graduates of that institution will be licensed to practise in Alberta without further examinations.

At the recent meeting of the Alberta Medical Association there was brought up the question of an amendment to the marriage laws whereby some restrictions will be placed on the marriage of physically and mentally unfit persons. This matter will be taken up with the Provincial Department of Health.

Some time ago the College of Physicians and Surgeons decided to present a life-size portrait of Lieutenant-Governor R. G. Brett to Alberta University which would be placed in the Medical Building. Owing to the illness of Dr. Brett this pleasant function has never taken place.

T. H. WHITELAW

The College of Physicians and Surgeons held a meeting during the course of the Alberta Medical Association's Congress when members had an opportunity to criticize or to make suggestions regarding the work of the Council.

Dr. Irving Bell, who has been taking post graduate work in London, England, returned on September 15th to Edmonton where he has resumed his practice. Dr. Bell was elected president of the Alberta Medical Association for the coming year, at the meeting of the Association held this week in the city of Calgary.

The meeting of the Edmonton Academy of Medicine held on September 9th, was addressed by Dr. Dunn, Medical Inspector of Schools, and Dr. F. S. MacPherson, member of the school board, on the question of carrying out more fully the toxin-antitoxin treatment of school children for the prevention of diphtheria. The number of children already voluntarily inoculated by physicians, School Board Medical Service and the health department, was as yet only about 10 per cent. of the whole. The members of the Academy agreed to do all that was possible to assist in having this work carried out and inducing more parents to have their children protected.

Congratulations of his medical confrères are due to Dr. Walter Scott, son of the late Honorable D. L. Scott, Chief Justice of Alberta, on his marriage on September 2nd to Miss Katie Sinton Cowan, daughter of Mr. and Mrs. Hector Cowan, of Edmonton. Dr. and Mrs. Scott will return from their honeymoon trip to the Pacific Coast about the end of the month.

Dr. T. H. Prust, Edmonton, who was accompanied by Mrs. Prust, recently took the Tri-state post graduate medical tour, which included England, Ireland, Scotland and France. The doctor was highly delighted with his

experience and strongly recommends this method of taking post graduate study.

Dr. Evan Greene, Lecturer in Anatomy, and instructor in Surgery, and Colonel Mewburn, Professor of Surgery, University of Alberta, during the summer visited the Old Land and spent some time studying the methods followed in the University College Hospital, London.

Dr. M. E. MacKay returned to Edmonton on September 14th, after taking a post-graduate course in surgery at Vienna, London and Edinburgh.

BRITISH COLUMBIA

Dr. M. Fox is leaving Vancouver on September 20th for Atlin, B.C., where he will take care of the practice of Dr. C. M. Eaton.

Dr. J. W. Lang, late of Hutton, B.C., is now practising at West Vancouver, B.C.

Dr. Gerald R. Baker, of Quesnel, is taking a month's well earned vacation, as from September 10th. His practice will be taken care of by Dr. L. G. C. d'Easum.

The office of the British Columbia Medical Association has been kept busy during the past few weeks supplying men to do locum tenens work for doctors taking vacations. Relief has recently been supplied to Campbell River, Port Alice, Armstrong, Fernie, Cranbrook, Duncan, etc.

A meeting of the executive of the British Columbia Medical Association was held on September 1st, when several important matters were dealt with. It was decided to continue the periodical luncheons during the fall and winter months, and it is hoped that one of the eminent speakers visiting Vancouver in connection with the opening of the university may be secured to give an address at the first luncheon to be held about the middle of October. The plans of the chairmen of the various standing committees indicate a busy time for all concerned, particularly the Publicity and Educational, and Industrial Service Committees.

The semi-annual meeting of the No. 6 District Medical Society will be held at Nanaimo on September 25th. Addresses will be given by Dr. C. H. Vrooman, Dr. W. A. Dobson and Dr. Howard Spohn.

The annual meeting of the No. 4 District Medical Society (Okanagan Branch), will be held at Merritt on September 21st. The President, Dr. J. J. Gillis, and the Secretary Treasurer, Dr. Lee Smith, intend this meeting to be a great success. The speakers on clinical subjects will be:—Dr. F. P. Patterson, Dr. Geo. E. Seldon and Dr. Lyall Hodgins, of Vancouver, whilst Dr. H. H. Murphy and Dr. J. H. MacDermot, President and Secretary Treasurer of the B. C. Medical Association, respectively, will each speak on medico-political matters.

The following items are reported from the Vancouver Medical Association:—

Dr. A. W. Bagnall left a few days ago for the east. He expects to do postgraduate work in Toronto, Boston, and New York, and will be away from Vancouver for about two months.

We are very glad to report that Dr. A. S. Monro, who has been seriously ill all summer, is now quite recovered and has resumed practice.

Dr. Geo. E. Seldon and Dr. A. B. Schinbein are two Vancouver surgeons at present in the east, the former in pursuit of his duties as a member of the Dominion Medical Council, and the latter with a view to postgraduate study.

Miss K. Ellis, the popular superintendent of nurses at the Vancouver General Hospital, has been absent from her duties for the past month on account of illness.

Dr. Alison Cumming, who, we regret to say, is still seriously ill, has gone to Montreal, and his many friends in Vancouver hope to hear better news of him in the near future.

Dr. J. W. Arbuckle,who has recently returned from Europe, has given up practice in Vernon and intends specializing in gynæcology and obstetrics in Vancouver.

The recent marriages of three of the younger members of the profession in British Columbia, Dr. O. Van Etter, of New Westminster; Dr. L. G. C. d'Easum, of Vancouver, and Dr. M. Fox, late of Vancouver and now at Atlin, B.C., will be reported at greater length in next month's issue. In the meantime, they are receiving the hearty congratulations of their many friends.

J. EWART CAMPBELL

UNITED STATES

Scholarships on the Oliver-Rea Foundation for graduate study in medicine are available at the New York Post-Graduate Medical School and Hospital. Inquiries should be addressed to the Dean, 301 East 20th Street, New York City.

The annual meeting of the American College of Radiology and Physiotherapy will be held in Chicago on October 19, 20, 21 and 22 at Hotel LaSalle. Special railway rates of one and a half fares for the return journey are offered. All radiologists and physiotherapists are invited.

Under the auspices of the New York Academy of Medicine, 17 West 43rd St., New York, there has been prepared a series of synopses of courses for postgraduate studies in New York City, and these are now available for distribution. The Academy also maintains a Bureau of Clinical Information where information is available regarding opportunities for graduate medical study in New York, as well as in other cities in the United States and abroad. Information regarding graduate work in Great Britain and on the Continent is also on file and the Bureau is prepared to answer inquiries concerning ordinary internships, special or resident. Doctors visiting New York may have mailed to them, if desired, a daily bulletin of surgical clinics, and there has also been prepared for the use of visitors whose stay in the city is limited, a book of fixed clinics of Greater New York, with a transportation guide. This is furnished without charge.

XUM

Book Reviews

Medical Education—A Comparative Study. By Abraham Flexner. 334 pages. Price $2.50. The Macmillan Company, New York and Montreal, 1925.

There is perhaps no subject, not even religion, on which there is a greater diversity of opinion than on what should be exacted in the training for entrance to the medical profession. Every one who has graduated from a medical school apparently unconsciously assumes that he is thereby qualified to be an expert on medical education. The result is a welter of opinion on which experience seems to exercise very little influence. There would be chaos in our systems of medical instruction were it not that tradition, the massed opinion of past generations, sways and determines what will prevail here and there in the western world in the type of medical curriculum exacted. Against this massed opinion behind this or that system the expert, amateur or skilled, unless he recognizes that human attitudes change slowly, may undertake crusades for reform with hopes destined to end in futility.

How complex is the problem of what a medical training should be, to be of the most effective service afterwards, is revealed in the volume by Dr. Flexner. The author has not undergone a training in medicine, but he has, in the service of the Rockefeller Foundation, been engaged for the last twenty years in a study of medical education as it obtains variedly in Europe and America, and the volume is a compendium of the observations he has made, and the conclusions he has reached after this prolonged survey of the subject. This volume, taken with "The Medical Sciences in the German Universities" by Theodor Billroth, translated from the German by Professor William H. Welch and published in 1924, renders accessible to all who desire to study the problems of medical education, a fairly comprehensive knowledge of the different systems and of the principles and different points of view involved, a knowledge otherwise difficult to acquire because of the labour necessary to get in touch with all the sources.

The volume is not only a compendium of such information; throughout it there is discussion and often very pertinent criticism of the different systems of medical education, which will react as a relish to the reader. Of special interest are the portions which deal with the history of the development of medical education during the last hundred years, a history that explains the origins of the systems so different in their conceptions as to what the products should be.

It is impossible in the brief space allowed for a review to discuss even a few of the subjects dealt with, for to do so adequately, lengthy disquisitions would be necessary. Doubtless the volume for the next few years will furnish material for many an editorial pronouncement. Those who may give attention to medical education, while not necessarily accepting all the views of the author, will, we venture to say, consider it a distinctly valuable and timely contribution.

A. B. MACALLUM

Transactions of the American Surgical Association. Vol. xlii. Edited by John H. Jopson, M.D. 730 pages, illustrated. Published by the Asociation, 1924.

This valuable volume of the transactions of the American Surgical Association is the forty-second year of its issue; it contains the usual lists of officers and Fellows of the Association and we note very sympathetic tributes to those Fellows who have passed on since the last issue of the transactions. Amongst those of special interest to the profession in the British Empire are included obituaries of two very distinguished Edinburgh surgeons, Mr. John Chiene and Henry Alexis Thomson, from the pen of Sir Harold Stiles. The volume embraces forty-four papers which cover pretty well the whole of the surgical problems of the body. Looking over such a volume the reviewer cannot but feel how much value there is in such surgical opinion, especially to the general practitioner.

A digest of such a volume as this would help to answer many of the problems of prognosis with which the family physician must constantly deal. They are, throughout the work, the observations, statistically based opinions and considered judgment of men who have a right to give such opinions on the ever recurring and also rarer conditions calling for decision and judgment.

Take from this view point, for instance, the paper by Peck, of New York, on Cancer of the Colon, his opinions, after an extensive clinical and surgical experience again emphasize the high degree of operability of such growths, if we exclude the rectum, and he emphasizes, how not infrequently both adjacent infiltration and glandular involvement may be inflammatory and not malignant. There is a most valuable paper by Judd and Pollock of the Mayo Clinic on diverticulitis of the colon. This is a condition which modern methods have done much to clarify and incidentally to reveal its relative frequency. They point out its peculiarity for affecting the sigmoid; in fact they have not observed it at any other site in the colon. There are various papers on such subjects as multiple cancers of the colon, on rupture of the intestine following reduction of strangulated femoral hernia, all pointing out the odd and unusual surgical complications..

Gibson, of the New York Hospital, reviews a series of cases labelled "chronic appendicitis." This is a class of case which does not always present the results to be desired. Of the total number 259 or 46 per cent. reported themselves as being in excellent health, making absolutely no complaint. One hundred and two or 18 per cent. returned a report which could only be classed as unsatisfactory. Such a list includes, as he says, those who really have some definite symptoms, those whose statements are unreliable, and neurotics. He emphasizes the value of a definite, intelligent history of previous attacks, and of the importance at the operation of thorough abdominal exploration. In this connection it is interesting to note the virtual disappearance of the McBurney incision for such class of cases, since it permits of such a limited examination.

It will be impossible within the limits of this review to refer to all the valuable articles in the book. There is for instance the report of the fracture committee of the American College of Surgeons, a paper by Bloodgood on bone tumours, and a valuable group of papers by Tinker of Ithica, Ochsner of Chicago, Dowd of New York, on the end results in conditions caused by goitre and the results following operation in goitre. It is a volume which if it could not be in the hands of every general practitioner should at least be within his reach by applying to his nearest medical library.

H. E. CLUTTERBUCK

Forensic Medicine. Sydney Smith, M.D., D.P.H. pages, 117 illustrations. Price $7.50. The MacMillan Co. of Canada, Toronto, 1925.

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average medical man to assist the ends of justice, but there is a large gap between such general knowledge and the specialization of the subject, which is all the more apparent when one takes up such a book as this.

A new text-book on the subject is welcome, since there have been few of recent date and probably none by an author with a more extensive experience. Prof. Sydney Smith's work has been chiefly carried on in Cairo, where there is great opportunity for studying medico-legal problems. He has also at his disposal there an institute equipped with modern facilities for complete pathological and toxicological research, which he has developed to the full.

The book is in two main divisions, the first being concerned with the medical practitioner in the rôle of a potential expert witness, and in this section there is a comprehensive survey of all the more common problems in crimes of violence, unexpected death, legitimacy and disputed paternity, accidents and compensation and identification, to mention but a few.

In the second division the legal enactments concerning the medical profession are discussed, as well as its special responsibilities, moral as well as legal, and this is clearly written and aptly illustrated. In speaking of the differentiation between a qualified and unqualified practitioner, in the eye of the law, he remarks that the only recognized difference seems to be that the one shall exercise a greater degree of skill than the other. This was made the ground for the old Mohammedan decision concerning a man who went to a veterinary surgeon for treatment and lost an eye. "The court found that he had no case, since had the man himself not been an ass, he would never have gone to a horse doctor!"

The book is written for students and practitioners, and the clearness and simplicity with which it is arranged, as well as the abundance of material on which it is based make it a valuable and attractive manual.

H. E. MACDERMOT

Refraction of the Eye. Ernest Clarke, M.D., F.R.C.S. Fifth edition, 251 pages, 99 illustrations. Price $2.75. London: Bailliere, Tindall & Cox. Canadian distributors: McAinsh & Co., Toronto, 1925.

There is so much to be commended in this treatise on refraction that perhaps one should pass it as exactly fitting the case. The introductory chapters are clear and concise, and prepare well for the discussion of the actual anomalies in eye-shape, and muscle-function which make such a text-book necessary.

The average reader will soon recognize that the writer is an enthusiast. In the chapter (all too short) where he connects up the results of refractive error with general medical problems, some may say that his enthusiasm runs away with him, and take issue with him on certain points, e.g., the relationship of refractive error to lens-change; the ocular etiology of early morning head-ache; the attitude towards the problems of migraine and epilepsy. This enthusiasm is also indicated in such a paragraph as, "It has been suggested that eye-strain is present in patients suspected of being in the so-called pretuberculous stage, and that by removing the eye-strain the advent of tubercle may be prevented. This is quite consistent with the above theories, and with the experience of many." Such paragraphs must be read with great caution, and unless carefully winnowed, may lead to erratic practice, and the induction of false hopes, with resulting loss of confidence in the physician as an individual, or in us all, as a class. The recurring praise of the ophthalmometer as an almost indispensable aid, will, I think, not find an echo in the experience of most oculists. But taken as a whole, one can find little to criticize as faulty, and much to commend as excellent.

The volume is a convenient size, well bound and well printed, so that reading it is a pleasure.

F. C. TREBILCOCK

"Enzyme Intelligence, and Whence and Whither." By Nels Quevli. $3.65 postpaid. Standard Book Company, Lakefield, Minn., 1925.

The author of this book has put a lot of things together which make interesting reading, in an attempt to solve the riddle of the universe in terms of the theory of enzymes acting in conjunction with the ether of intermolecular and interplanetary space. It is by way of reaction to the extreme views of mechanists and fundamentalists, the former not believing in the reality of life, somewhat in the same fashion that Christian Scientists hold that there is no illness; the latter not accepting the evidence for evolution.

The author's method is to state his propositions in everyday language and to "back them up with a large number of quotations from the best authorities." In this way he has produced a courageous and unconventional volume, although it must be admitted that at times his argument wears a trifle thin as, for example, when he implies that all the bacteria that enter the alimentary canal through the mouth are destroyed by the hydrochloric acid in the gastric juice and, consequently, that the intestinal bacteria must be re-created by their residual enzymes.

The opening assumption is that all phenomena arise from the three great and only realities of which we have any inkling: matter, ether and life. The enzymes are the "ultimate units of life" and activate the cell as men operate a submarine from within. The watchword "ether to ether, and enzyme to enzyme" replaces the old saying "dust to dust and ashes to ashes." He claims that there is no reason to doubt that life is as old as the universe nor that enzymes and spores move in the ether. One looks for an early reference to the work of Arrhenius but when it comes the name is spelt "Arheneus." This is rather a pity and there are others.

With regard to the enzyme theory of life, he supports the catalytic hypothesis expounded by Dr. Leonard Thompson Troland of Harvard University in the *American Naturalist* (51, 1917. "Biological Enigmas and the Theory of Enzyme Action") from whose article he culls a lengthy extract through the medium of the *Literary Digest*. "We shall see," he says in Chapter X, "by further consideration of the three main classes of enzymes, such as ferments, vitamines and hormones, that in fact the enzymes are in complete charge of our bodies, and that they not only do all the different kinds of work necessary to keep the body going, but also do all the thinking in the brain."

The text oscillates on the borderline between the senses and the imagination and is obviously not to be judged by ordinary standards. It conveys a thoughtful man's views, backed by sound intelligence and wide reading, to an expectant gallery. It is a curiosity of biological literature and something more than that. Chapter XIV, entitled "What am I?" is distinctly intriguing. The illustration of skeletons of man and anthropoid apes on p. 484 is wrongly attributed to Haeckel instead of to Huxley.

A. WILLEY

A Compend of Obstetrics. Revised and edited by Clifford B. Lull, M.D. Tenth edition. 283 pages, 84 illustrations. Price $2.00. P. Blakiston's Son & Co., Philadelphia, 1925.

Whether or not these compends, written for the purpose of directing students to success in their examinations, are to be recommended, is a matter of grave doubt. If they are, then this little book has its place, for of its kind it is very good. The matter is well classified and the teaching for the most part is sound and conservative. What is more, it is printed on excellent paper and well illustrated, although one feels that the illustrations given to such a seldom performed operation as vaginal Cæsarean section are somewhat redundant. Such mistakes in spelling as "hypatic" for "hepatic," "Scanzonia Manuevre"

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for "Scanzoni manœuvre" and "Strogono" for Strogonof" rather mar the text. Probably the weakest section of the book is that dealing with the toxæmias of pregnancy, and it is difficult to see how a student could gain anything but confusion from a study of it. As an offset to this, however, the sections dealing with the prenatal and postnatal care of the mother are as full of sound sense and good teaching as similar sections in much more pretentious books. The Strogonof treatment of eclampsia is incorrectly described, nor can one agree with the author when he says that "all cases (of placenta prævia) should have the uterus and vagina tightly packed with gauze," as a post-partum precaution against hæmorrhage. However, one cannot expect perfection in a book of such scope and if students must ingest their learning by the "grape-nuts" method they could do worse than cram obstetrics from this compend. H. B. ATLEE

The Practical Medicine Series, Vol. V. Gynæcology. Edited by Thomas J. Watkins, M.D., F.A.C.S. **Obstetrics**, edited by Joseph B. De Lee, A.M., M.D., and J. P. Greenhill, B.S., M.D. 534 pages, illustrated. Price $3.00. The Year Book Publishers, 304 S. Dearborn St., Chicago. Series 1924.

This book bears on the cover the title of "Gynæcology and Obstetrics." It is simply a boiled down aggregation of articles printed in the American and European journals during 1924. The articles are arranged under the same headings as might be a new work on gynæcology or obstetrics. The authors of the work are legion—some 450; the editors, Drs. Watkins and Lee, act more in the capacity of referees. Their part consists in the choice of articles and occasionally a brief criticism of a few lines, where there is special agreement or disagreement.

The book makes interesting reading for the practitioner. It fills a long felt want in supplying only those articles more or less valuable in the opinion of these eminent editors. Also it is in a concentrated form and thus much more readily absorbed. In the writer's opinion, the work is of no value from the standpoint of the undergraduate student.

W. B. BURNETT

Personal and Community Health. Clair Elsmere Turner. 426 pages, illustrated. Price $2.50. The C. V. Mosby Co., St. Louis. Canadian Agents, McAinsh & Co., Toronto, 1925.

The acknowledgements of the author, in the preface, of valuable assistance received in its production from various writers, recognized by all as authorities in matters of public health naturally lead one to regard this volume as an authority on the latest developments of public health problems. This expectation is fully realized.

The author has succeeded in admirably covering the ground of health activities in plain, simple language, which, while not too technical, conveys to the reader in a concise and interesting manner, the essentials of personal and community health. Emphasis is put upon things now known to be of paramount importance, while many things which are still to be found in some of our text books on hygiene and medicine are discarded or shown to be of relatively little value. It may surprise some physicians and certainly the lay public, to learn that the time-honoured fumigation as a means of disinfection is now known to be of little value; it is predicted that it will shortly be abandoned even by health departments, which continue to use it for the terminal disinfection of scarlet fever, diphtheria and smallpox; further that the desquamation following scarlet fever is of no importance in considering the question of release from quarantine even though it has been believed from time immemorial to be the chief factor in the spread of the disease. The complete disappearance of desquamation before release from quarantine is, however, still required in some provincial and state regulations.

Chapter 1. on Health Values, is an excellent introduction and general statement of the subject, containing many valuable suggestions, and render the work suitable for college or university students as a text book, including as it does, chapters on food control, school and industrial hygiene, water supply, waste disposal, and ventilation, heating and lighting.

In Appendix A, the author after stating the recent discoveries in relation to the treatment of measles by the blood serum of convalescents and the Dick test and serum treatment for scarlet fever, includes the report on the control of communicable disease recently made by a special committee of the American Public Health Association. This report is arranged in convenient form for reference, and must be regarded as authoritative and reliable, the result of long experience and careful study of communicable disease by the well known members of the committee.

In respect, however, to the question of quarantine for smallpox the committee seems to have greatly underestimated the value of vaccination as a protection, in stating that quarantine means "Segregation of *all* exposed persons for twenty-one days from date of last exposure or until protected by vaccination." Surely those who can prove that they have fully protected themselves by recent successful vaccination and especially by revaccination, should be exempted from this ruling and at once freed from all restriction after being properly disinfected. Further, under general measures, vaccination in infancy, revaccination at school age and vaccination of the *entire* population are advised when the disease is prevalent. The use of the word "entire" without qualification as to previous vaccination and revaccination, is hardly calculated to give the public the impression that the medical profession has implicit confidence in vaccination as a prophylactic against smallpox. Moreover revaccination on entering school, would, in the vast majority of children vaccinated in infancy, produce nothing but an immunity reaction and would be ineffective. It would therefore seem advisable to postpone revaccination to the tenth year, for those successfully vaccinated in infancy. To offset the propaganda of the anti-vaccination cults and to favour the increase of the proportion of vaccinated people in any community, the value of vaccination and subsequent revaccination should be fully recognized and stated in our health regulations, to the extent at least of allowing freedom from quarantine restrictions to those who have been protected by previous successful and sufficiently recent vaccination. T. H. WHITELAW

Arteriosclerosis. Sir T. Clifford Allbutt, P.C., K.C.B., M.A., M.D., 108 pages. Price $1.50. Macmillan Co. of Canada, Ltd., Toronto, 1925.

George Eliot has drawn a picture of a busy keen-minded doctor reading with absorption till the small hours of the morning some new work on fever. If "Middlemarch" were to be written to-day Dr. Lydgate might well have been made to take Sir Clifford Allbutt's book to bed with him—except that it is supposed that Sir Clifford was himself the model for Lydgate. This short but pithy essay on arteriosclerosis is an instance of how much can be said in a short space by one whose experience and knowledge was so vast, to which must be added that the essay is written as only Sir Clifford Allbutt could write, with a command of English that never leaves his meaning obscure or the mind of the reader dulled.

The whole of the opening chapter is devoted to "Our Meanings." What, he asks, do we mean by arteriosclerosis, and under his scrutiny our terms indeed seem threadbare. "We are apt to form certain fixed habits of speech and thought, habits which

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hinder or warp the free play of our minds; and we hamper ourselves with abstract phrases, or are content with phylacteries, such as 'intestinal toxins,' 'compensation,' 'morbid entity,' and many another which need much sifting and at least some evidence....as some one said of another matter, 'We are guessing in the dark about a guess in the dark!' "

H. E. MACDERMOT

Modern Surgery. General and Operative. By John Chalmers DaCosta, M.D., LL.D., F.A.C.S. Ninth edition, revised. 1527 pages, 1200 illustrations. Price $10.00. W. B. Saunders Co., London and Philadelphia. McAinsh & Co. Ltd., Toronto, 1925.

As nearly as possible the author has covered his subject in one volume, at least to the satisfaction of the reader. He has accomplished this by deleting a great deal of unnecessary padding, which, heretofore, has taken up much space in works of this kind, and by stressing those conditions which are commonly met in practice. This will be noticed more especially in his opening chapters dealing with surgery in general and introducing in natural sequence the conditions which occur in inflammation, gangrene and infections of different kinds.

Generally speaking, the work is easily read. Its frequent cuts and references to authorities on subjects under discussion being especially noticeable. A few minor criticisms may be made. While the coloured prints are good, this cannot be said of the x-ray photographs, more particularly those having to do with gastro-intestinal, kidney and ureter work. It is regrettable that authors do not give more space to the differential diagnosis of kidney and ureter lesions. The author will not get everyone to agree with him in his treatment of peritonitis by flushing. The chapters on goitre are not up-to-date nor do they give a clear-cut differentiation of the types of goitre. A general criticism of the majority of works on surgery may also apply to this work, viz. conservative surgery is not stressed. Instructions when not to operate are probably as important as when to operate. A great deal of good could be done by a few chapters on this very important subject. Notwithstanding these criticisms this book in my opinion is well worth a front place in the library of any busy general practitioner or surgeon.

J. K. MCGREGOR

Approaching Motherhood. By George L. Brodhead, M.D. 180 pages. Price $1.50. Paul B. Hoeber, Inc., New York, 1925.

This little book contains valuable advice on an important subject. The various questions which may come up in an expectant mother's mind are first asked and then in a very simple and conclusive manner answered. One feature of the work which might give ground for criticism is the more or less technical diagnosis of pregnancy made from a physician's standpoint on page 10. As one proceeds a little farther in the volume (page 15), one is struck by the omission of a few of the cardinal signs and symptoms of ectopic pregnancy, such as lower abdominal pain, uterine hæmorrhage, followed by faintness associated with signs of pregnancy, following a period of either amenorrhagia, or in the case of a formerly sterile woman. The writer mentions on page 20 the danger of setting free possible thrombi by massaging the legs during pregnancy for muscular cramps. Exception might be taken to this as not meeting the approval of the profession at large, and only adding more worry to the expectant mother.

In the chapter entitled "Accidents," the paragraph "what can be done in an emergency when the doctor has not arrived" is good advice, and the supply of boiling water and of cold boiled water may be very much appreciated by the doctor, and be advantageous to the patient.

Criticism might be offered against self-diagnosis and self-treatment and drugging for such conditions in pregnancy as pruritus, heartburn, neuralgia, leucorrhœa and nausea, as being detrimental to the profession and to the patient; advice on self-drugging has no place in any book written for the laity. On page 62 attention to the possible cause of headache during pregnancy and its significance is well taken.

The point in this little book which I think will do much good is what has been written on page 152 regarding childbed fever, and the physicians' and nurses' attempts to avoid it.

A physician may freely advise his patients to purchase the book on approaching motherhood, especially if the faulty factors are pointed out to the patient.

GILBERT GORDON

International Clinics. Vol. ii, thirty-fifth series, 1925. Edited by Henry W. Cattell, A.M., M.D., Philadelphia. 311 pages, illustrated. Price $2.50 per volume or $10.00 for the series of four. The J. B. Lippincott Co., 201 Unity Bldg., Montreal.

This is an interesting volume and contains articles on a variety of subjects.

The articles on affections of the kidney and on dysentery are reviews of our knowledge of these subjects brought up to date. They are well illustrated and extensive bibliographies are given. There is also a clear and comprehensive article on the reticulo-endothelial system which enables one to understand better the modern views of the blood, liver and spleen.

Of more historic interest is the article by Cattell on Tait McKenzie's Portraits of Medical Men.

R. H. M. HARDISTY

Methods in Surgery. Glover H. Gopher, M.D. 232 pages, with charts. Price $3.50. The C. V. Mosby Co., St. Louis. Canadian Agents, McAinsh & Co., Toronto, 1925.

This little volume is a compilation of methods used in the surgical divisions of Barnes Hospital, Washington Dispensary and St. Louis Children's Hospital. It includes outlines of case history taking, preoperative and postoperative care of patients, routine diets, etc. It also contains models of record forms used in the various departments.

The primary purpose of the book is the guidance and instruction of house officers working in the hospitals mentioned. The matter presented is of much value to hospital superintendents and resident surgical officers who will find standards upon which they may base routine practice or modify methods in use in hospitals of whatever size.

A Canadian must cavil at the use of "Morphia gr. 1/6 s.o.s." (si opus sit) and "Pathology present" as well as the terms "Registered M.D." and "Attending M.D." It is also noticed that authority has given place to usage in the spelling of morphine which is written "morphia" throughout the book although the other alkaloids mentioned are all given the regular "-ine" termination.

The writer has thoroughly accomplished the purpose for which the book is designed. It should be most useful to the class for whom it was published.

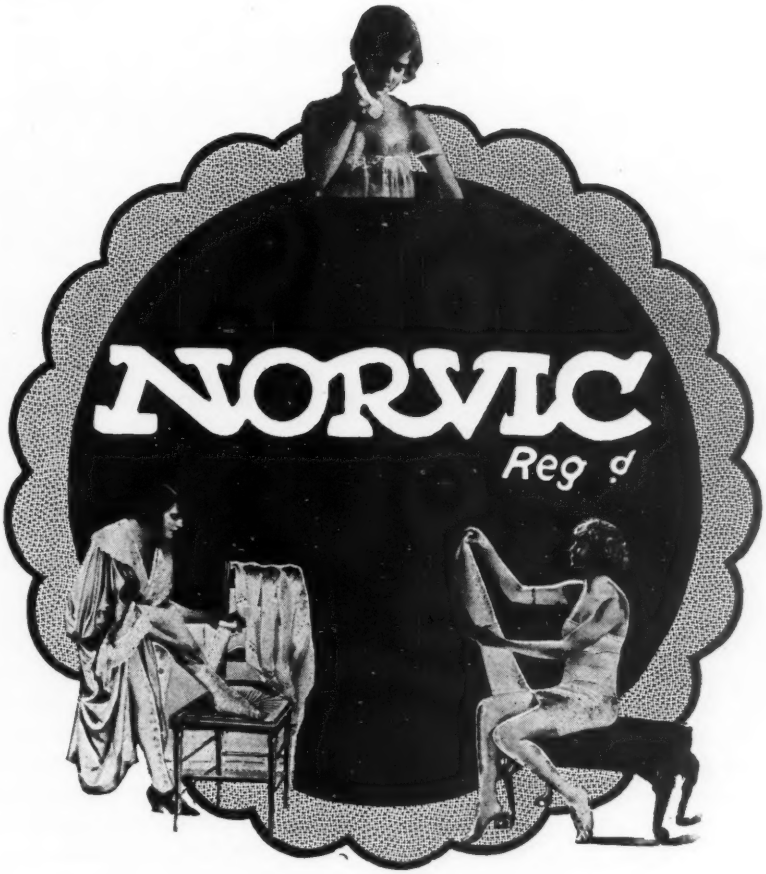
MALCOLM H. V. CAMERON

A Text-Book of Surgical Handicraft for the Use of Medical Students—By J. Renfrew White, M.S., F.R.C.S. (Eng.) 556 pages. Price $6.00. The Macmillan Co. of Canada, Ltd., Toronto. 1924.

This is a well written book, clearly outlining methods of preparation and care of surgical cases.

The book should be of great value to internes and to practitioners working without the aid of trained assistance.

E. W. ALLIN



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The Surgical Clinics of North America. Vol. V, No. II (New York Number—April). 337 pages, 105 illustrations. Per clinic year, February to December, 1925. Price paper, $12.00; cloth, $16.00. W. B. Saunders Co., London and Philadelphia. McAinsh & Co., Toronto.

This volume is a valuable addition to the many clinics that have already been published. The list of contributors contains such well known and brilliant clinicians as Dr. John F. Erdmann, Dr. Eugene H. Pool, Dr. Willy Myer, Dr. George Grayward, and others. The particular value of the volume is the diversity of subjects covered, and the record of personal experience with the cases which pass under their hands.

In the clinic of Dr. Charles Gordon Heyd, the subject of thyroid gland disease is covered in considerable detail; the classification, different from that of other writers, is from a theoretical standpoint of great value. The discussion is very scientific. The latest theories of thyroid physiology and pathology being propounded.

In the clinic of Dr. Eugene H. Pool, such subjects as common bile duct obstruction, gastro-enterostomy for duodenal ulcer and ectopic gestation are discussed. In a case of suspected ectopic gestation an exploratory operation failed to reveal any pathological condition of that character; it would appear from the case record that the symptoms were not given their proper significance. Our most valuable aid to-day in making a diagnosis, as in the past, is a carefully taken and carefully studied case record. The points should be given only the significance due them and the absence of a symptom carefully considered.

Dr. George Gray Ward at the Women's Hospital gives a most valuable clinic, covering in a most conservative way a variety of subjects. His personal observations on many gynæcological details are of much value.

Dr. Willy Myer and Dr. Max Einhorn's discussion of the diagnosis of gall-bladder disease and the remarks on thrombo-angiitis obliterans are full of valuable thoughts.

I consider this volume one of great value to both the general surgeon and the general practitioner.

D. S. MACNAB

Repetitive Work in Industry.—The Industrial Fatigue Research Board of the Medical Research Council has published a report on an industrial investigation of the effects produced on four girls of different degrees of intelligence by work entailing incessant repetition. The results of introducing various rest pauses into the work was also studied, and a comparison was made of time-rate and piece-rate remuneration. The repetitive work consisted of cross-stitching, with a coarse silk thread on canvas squares. The output was measured by the number of stitches; the work could not become automatic, as it required constant attention. The girls worked for six hours a day, in two spells of three hours each, for four days a week. It was found that the two most intelligent girls were the most variable workers, and that the girl with subnormal intelligence showed a steady improvement in ability. The investigation thus supported the view commonly held that the highly intelligent individual is not suited to repetitive work, and it is suggested that it might be possible to distinguish these types in children while at school, with a view to preventing the individual from engaging later in unsuitable occupations. The introduction of rest pauses did not benefit the output, but it is pointed out that with an eight hours' day and a week of five and a half days the results might have been different. Comparing the output of the time-rate and piece-rate bases of payment for output, it was found that under piece-rate conditions the output curves were on a higher daily level in all cases, but that with workers of approximately equal capacity the variation about the average was less. Competition between the more equally skilled girls aided output and occurred more frequently under piece-rate conditions, but the output of the less skilled workers seemed to be reduced owing to discouragement. Emphasis is laid on the importance of this point in the consideration of the many psychological problems raised by team work in industry. Team work may increase output in certain circumstances, but an effective team should consist only of workers of approximately equal abilities. Failing this the faster worker will be retarded by the presence of the slower, and the output of the latter will decrease because she is discouraged by the presence of the former; thus a vicious circle is created. The good effects of changing from time-rate to piece-rate conditions were more marked in the more intelligent and variable types of worker.—Editorial, *British Med. Jour.*, Aug. 29, 1925.